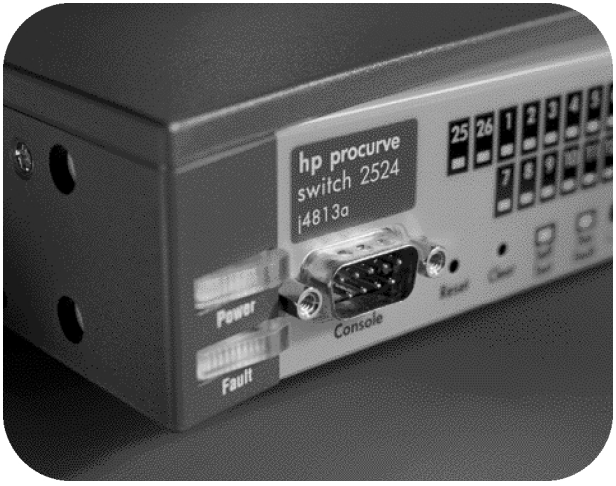
installation and
getting started guide



hp procurve
series 2300 and 2500 switches

www.hp.com/go/procurve

HP ProCurve
Series 2300 and 2500 Switches

Installation and Getting Started Guide

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Applicable Products

Series 2300:
- HP ProCurve Switch 2312 (J4817A)
- HP ProCurve Switch 2324 (J4818A)

Series 2500:
- HP ProCurve Switch 2512 (J4812A)
- HP ProCurve Switch 2524 (J4813A)

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Safety

Before installing and operating these products, please read the “Installation Precautions” in chapter 2, “Installing the Switch 2300 and 2500”, and the safety statements in appendix C, “Safety and Regulatory Statements”.

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Introducing the HP ProCurve Series 2300 and 2500 Switches

The HP ProCurve Series 2300 and 2500 Switches are multiport high-speed switches that can be used to build high-performance switched workgroup networks. These switches are store-and-forward devices that offer low latency for high-speed networking. With these switches you can directly connect computers, printers, and servers to provide dedicated bandwidth to those devices, and you can build a switched network infrastructure by connecting these switches to hubs, other switches, or routers. In addition, the Series 2500 Switches offer full network management capabilities.

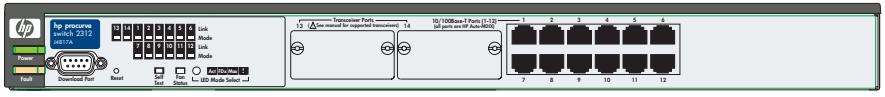
This chapter describes your HP Series 2300 and 2500 Switches including:

- Front and back of the switches
- Features
- Switch operation overview

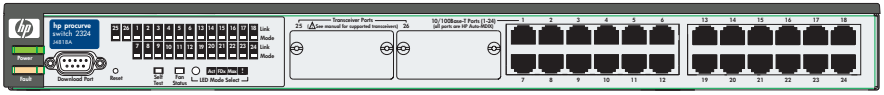
Throughout this manual, these switches will be abbreviated as the "Series 2300 Switches" and "Series 2500 Switches", or when common features are being described, as the "Series 2300 and 2500 Switches".

Series 2300 Switches

HP ProCurve Switch 2312 (J4817A)

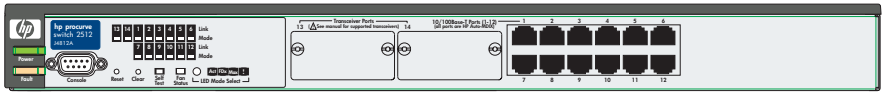


HP ProCurve Switch 2324 (J4818A)

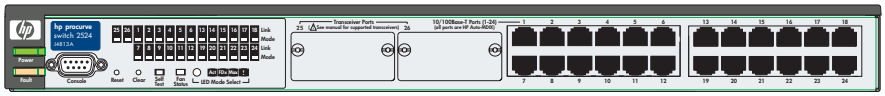


Series 2500 Switches

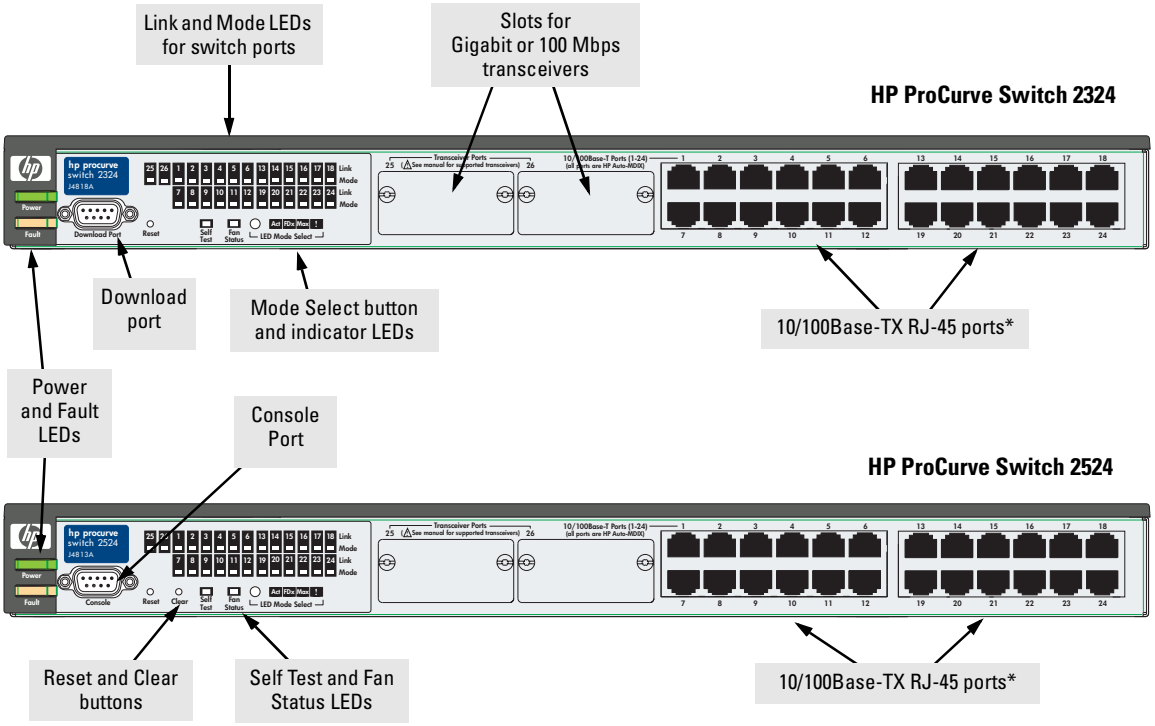
HP ProCurve Switch 2512 (J4812A)



HP ProCurve Switch 2524 (J4813A)



Front of the Switches


Link and Mode LEDs for switch ports
Slots for Gigabit or 100 Mbps transceivers
HP ProCurve Switch 2324
Download port
Mode Select button and indicator LEDs
10/100Base-TX RJ-45 ports*
Power and Fault LEDs
Console Port
HP ProCurve Switch 2524
Reset and Clear buttons
Self Test and Fan Status LEDs
10/100Base-TX RJ-45 ports*

* All 10/100Base-TX RJ-45 ports have the HP Auto MDIX feature.

Network Ports

- 12 or 24 autosensing 10/100Base-TX ports.
  All these ports have the "HP Auto MDIX" feature, which means that you can use either straight-through or crossover twisted-pair cables to connect any network devices to the switch.
- Two transceiver slots for installing any of the supported gigabit and 100 Mbps transceivers.

LEDs

Table 1-1. Switch LEDs

Switch LEDs	State	Meaning
Power (green)	On	The switch is receiving power.
	Off	The switch is NOT receiving power.
Fault (orange)	Off	The normal state; indicates that there are no fault conditions on the switch.
	Blinking†	A fault has occurred on the switch, one of the switch ports, or the fan. The Status LED for the component with the fault will blink simultaneously.
	On	On briefly after the switch is powered on or reset, at the beginning of switch self test. If this LED is on for a prolonged time, the switch has encountered a fatal hardware failure, or has failed its self test. See chapter 3, "Troubleshooting" for more information.
Self Test (green)	Off	The normal operational state; the switch is not undergoing self test.
	On	The switch self test and initialization are in progress after you have power cycled or reset the switch. The switch is not operational until this LED goes off. The Self Test LED also comes on briefly when you "hot swap" a transceiver into the switch; the transceiver is self tested when it is hot swapped.
	Blinking†	A component of the switch has failed its self test. The status LED for that component, for example an RJ-45 port, and the switch Fault LED will blink simultaneously.
Mode Select (3 green LEDs)	Act	Indicates that the port Mode LEDs are displaying network activity information.
	FDx	Indicates that the port Mode LEDs are lit for ports that are in Full Duplex Mode.
	Max	Indicates that the port Mode LEDs are lit for ports that are operating at their maximum possible link speed. For the 10/100TX ports, that is 100 Mbps; for any transceivers with Gigabit capabilities, that is 1000 Mbps.
	!	Indicates that the port Mode LEDs are displaying network events that could require operator attention, for example CRC errors or late collisions. See chapter 3, "Troubleshooting" for more information.
Fan Status (green)	On	The cooling fan is operating normally.
	Blinking†	The cooling fan has failed. The switch Fault LED will be blinking simultaneously.

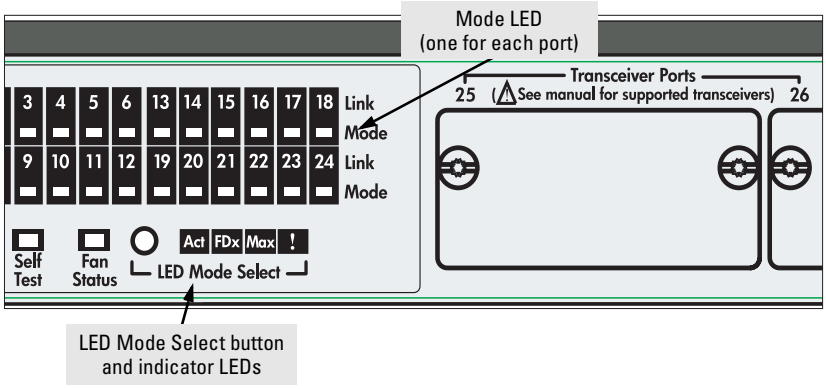
† **The blinking behavior is an on/off cycle once every 1.6 seconds, approximately.**

Table 1-2. Switch and Transceiver Port LEDs

Port LEDs	State	Meaning
Link	On	Indicates the port is enabled and receiving a link indication from the connected device.
	Off	One of these conditions exists: • no active network cable is connected to the port • the port is not receiving link beat or sufficient light • the port has been disabled through the switch console, the web browser interface, or HP TopTools.
	Blinking	If the LED is blinking simultaneously with the Fault LED, the corresponding port has failed its self test. The LED can blink by itself (no Fault LED blinking) for the transceiver ports. This occurs when a transceiver is installed and the switch has not yet been reset. Transceivers can be installed in the slots while the switch is powered on, but the switch must be reset to initialize the transceiver and make it operational.
Mode	Displays network activity information, or whether the port is configured for Full Duplex operation, or maximum link speed operation, or is experiencing network events requiring operator intervention depending on the mode selected. See “Mode Select Button and Indicator LEDs” below for more information.	

Mode LED Select Button and Indicator LEDs

To optimize the amount of information that can be displayed for each of the switch ports without overwhelming you with LEDs, the Series 2300 and 2500 switches use a Mode LED for each port. The operation of this LED is controlled by the Mode LED Select button, and the current setting is indicated by the Mode LED Select indicator LEDs near the button. Press the button to step from one mode to the next.



- If the Activity (Act) indicator LED is lit, each Mode LED displays activity information for the associated port—it flickers as network traffic is received and transmitted through the port.
- If the Full Duplex (FDx) indicator LED is lit, the Mode LEDs light for those ports that are operating in full duplex.
- If the maximum speed (Max) indicator LED is lit, the Mode LEDs light for those ports that are operating at their maximum possible link speed: 100 Mbps for 10/100 ports and 100-FX fiber-optic ports, and 1000 Mbps for 100/1000Base-T or gigabit fiber-optic ports.
- If the attention (!) indicator LED is lit, each Mode LED lights briefly for each network event that could require operator attention, for example, late collisions or CRC errors. See chapter 3, “Troubleshooting” for more information.

Console Port (Series 2500 Switches only)

This port is available on the Series 2500 switches, and is used to connect a console to the switch by using the serial cable supplied with the switch. This connection is described under "Connect a Console to the Switch" in chapter 2, "Installing the Switches". The console can be a PC or workstation running a VT-100 terminal emulator, or a VT-100 terminal.

Download Port (Series 2300 Switches only)

This port is available on the Series 2300 switches, and is used to connect a PC to the switch by using any "null modem" cable. This connection is described under "Connect a Console to the Switch" in chapter 2, "Installing the Switches". The PC can then be used to initiate a download of new code to the Series 2300 switch. New code may be made available if there are any product enhancements, for example to support new transceivers. (For the Series 2500 switches, you can download new code through the Console port.)

For the procedures to download new code to your Series 2300 switch, please see "Downloading New Code (Series 2300 Switch)" on page 3-12.

Reset Button

This button is used to reset the switch while it is powered on. This action clears any temporary error conditions that may have occurred and executes the switch self test. Press the Reset button also after installing any transceivers while the switch is powered on. After installing the transceiver, the switch must be reset to initialize the transceiver and make it operational.

For the Series 2500 switches, this button also resets all network activity counters to zero. The counters are displayed in the Series 2500 switch console interface, the web browser interface, and through SNMP network management applications, such as HP TopTools for Hubs & Switches.

Clear Button (Series 2500 only)

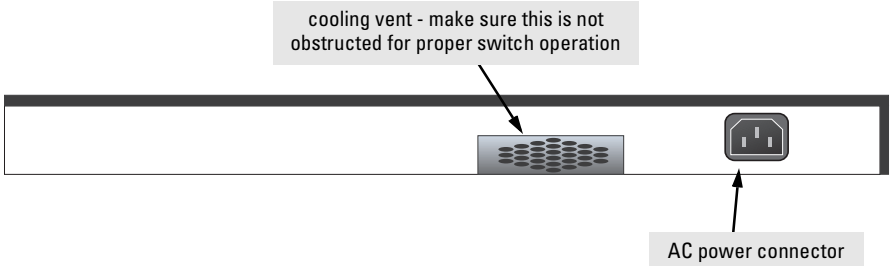
This button is used for these purposes:

- **Deleting Passwords** - When pressed by itself for at least one second, the button deletes any switch console access passwords that you may have configured. Use this feature if you have misplaced the password and need console access.

  This button is provided for your convenience, but its presence means that if you are concerned with the security of the switch configuration and operation, you should make sure the switch is installed in a secure location, such as a locked wiring closet.

- **Restoring Factory Default Configuration** - When pressed with the Reset button in a specific pattern, any configuration changes you may have made through the switch console, the web browser interface, and SNMP management are removed, and the factory default configuration is restored to the switch. For the specific method to restore the factory default configuration, see "Restoring the Factory Default Configuration" in chapter 3, "Troubleshooting" of this manual.

Back of the Switches



Power Connector

The Switch 2300 and Switch 2500 models do not have a power switch; they are powered on when connected to an active AC power source. The switches automatically adjust to any voltage between 100-127 and 200-240 volts and either 50 or 60 Hz. There are no voltage range settings required.

Switch Features

The features of the Series 2300 and 2500 switches include:

- 12 or 24 autosensing 10/100Base-TX RJ-45 ports with Auto MDI/MDI-X.
- two slots for installing supported gigabit or 100Base-FX transceivers.
- plug-and-play networking—all ports are enabled—just connect the network cables to active network devices and your switched network is operational.
- HP Auto-MDIX on all 10/100 twisted-pair ports, and IEEE 802.3ab Auto MDI /MDI-X on all 100/1000 twisted-pair ports, meaning that **all connections can be made using straight-through twisted-pair cables**. Cross-over cables are not required, although they will also work. The pin operation of each port is automatically adjusted for the attached device: if the switch detects that another switch or hub is connected to the port, it configures the port as MDI; if the switch detects that an end-node device is connected to the port, it configures the port as MDI-X.
- automatic learning of the network addresses in each switch's 4096-address forwarding table, (with configurable address aging value in the Series 2500 switches).
- automatically negotiated full-duplex operation for the fixed 10/100 RJ-45 ports when connected to other auto-negotiating devices — the transceiver ports always operate at full duplex.
- the Series 2300 switches have a Download Port, through which you can update your switch with the latest code, for any product enhancements or bug fixes. (For the Series 2500 switches, you can download new code through the Console port.)

The Series 2500 switches also include these network management features:

- easy management of the switches through several available interfaces:
  - **web browser interface**—an easy to use built-in graphical interface that can be accessed from common web browsers.
  - **console interface**—a full featured, easy to use, VT-100 terminal interface that is especially good for out-of-band switch management or for telnet access to the switch.
  - **HP TopTools for Hubs & Switches**—an SNMP-based, graphical network management tool that you can use to manage your entire network. This product is included with your new switch.
- support for the Spanning Tree Protocol to eliminate network loops

- support for up to 30 IEEE 802.1Q-compliant VLANs so you can divide the attached end nodes into logical groupings that fit your business needs.
- support for many advanced features to enhance network performance and network traffic control—described in the *Management and Configuration Guide* that came with your Series 2500 switch.
- download of new code for product enhancements or bug fixes.

Switch Operation Overview

Address Table Operation

Address Learning. As devices are connected to the switch ports, either directly or through hubs or other switches, the MAC addresses of those devices are learned automatically and stored in the 4096-entry address table featured by the Series 2300 and 2500 switches. The switches also identify the number of the port on which each address is learned so they know the network location of each connected device.

Forwarding, Filtering, Flooding. When the switch receives a packet, it determines the destination address and looks for the address in the address table. Based on the port location of that address, the switch then determines whether to forward, filter-out, or flood the packet.

- **forward** - if the destination address is on a different port than the one on which the packet was received, the packet is forwarded to the destination port and on to the destination device.
- **filter out** - if the destination address is on the same port as the one on which the packet was received, the packet is filtered out. The switch thereby isolates local traffic so the rest of the network connected to the switch does not lose bandwidth dealing with unnecessary traffic.
- **flood** - whenever a new destination address is found in a packet received on a switch port, the destination address will not yet be in the switch's address table and the switch cannot know whether to forward or filter out the packet. In this case, it sends the packet to all the other switch ports. This is referred to as "flooding". When the destination device receives the packet, and it replies, the switch learns the new address from the reply packet. Then, all future packets destined for that address are forwarded or filtered out appropriately.

  Note: Usually, multicast and broadcast packets are flooded, although configuration of sofware features influence that behavior.

Network Moves and Changes. When a PC, server, printer, or other network device is moved in the network, and becomes connected to a different switch port, the Series 2300 and 2500 switches automatically recognize the change and update their address table with the new port location of the device. Communication with the device is automatically maintained, without any address table manipulation being required by the network administrator.

Effect of VLANs (Series 2500 only)

On the Series 2500 switches, if you configure multiple virtual LANs (VLANs) on the switch, each VLAN behaves as a "logical switch" containing the switch ports that you assign to it. Each logical switch behaves as an isolated broadcast domain, just as if it were a separate physical switch. The forward, filter, and flood behavior described for the physical switch above, operates the same for each of the logical switches defined by the VLANs: packets are forwarded or flooded only to the ports that are within a given VLAN. Just as for separate isolated physical switches, there is no communication between ports that are in separate VLANs unless the VLANs are connected by an external router.

For more information on configuring VLANs and their behavior, see the *Management and Configuration Guide* that came with your switch.

Installing the Series 2300 and 2500 Switches

The HP Series 2300 and 2500 switches are easy to install. They each come with an accessory kit that includes the brackets for mounting the switch in a standard 19-inch telco rack, in an equipment cabinet, or on a wall, and with rubber feet that can be attached so the switch can be securely located on a horizontal surface. The brackets are designed to allow mounting the switch in a variety of locations and orientations.

This chapter shows you how to install your Series 2300 and 2500 switches.

Included Parts

The Series 2300 and 2500 switches have the following components shipped with them:

- *HP ProCurve Series 2300 and 2500 Switches Installation and Getting Started Guide* (5969-2353), this manual
- Customer Support/Warranty booklet
- Accessory kit (5064-2085)
  - two mounting brackets
  - four 8-mm M4 screws to attach the mounting brackets to the switch
  - four 5/8-inch number 12-24 screws to attach the switch to a rack
  - four rubber feet
- Power cord, one of the following:

Australia/New Zealand	8120-6803	Switzerland	8120-6807
China	8120-8377	United Kingdom/ Hong Kong/Singapore	8120-8709
Continental Europe	8120-6802	United States/Canada/Mexico	8120-6805
Denmark	8120-6806		
Japan	8120-6804		

The Series 2500 switches have these additional components:

- *HP ProCurve Switch Series 2500 Management and Configuration Guide* (5969-2354)
- *HP TopTools for Hubs & Switches* - CD ROM and enclosure
- Console cable

Installation Procedures

Summary

Follow these easy steps to install your switch. The rest of this chapter provides details on these steps.

1. **Prepare the installation site (*page 2-4*).** Make sure that the physical environment into which you will be installing the switch is properly prepared, including having the correct network cabling ready to connect to the switch and having an appropriate location for the switch. *Please see page 2-3 for some installation precautions.*
2. **Install transceivers *(optional—page 2-6)*.** The switches have two slots for installing any of the supported HP Gbps (gigabit) or 100 Mbps transceivers. Depending on where you will install the switch, it may be easier to install the transceivers first.
3. **Verify that the switch passes self test (*page 2-7*).** This is a simple process of plugging the switch into a power source and observing that the LEDs on the switch's front panel indicate correct switch operation.
4. **Mount the switch (*page 2-9*).** The Series 2300 and 2500 switches can be mounted in a 19-inch telco rack, in an equipment cabinet, on a wall, or on a horizontal surface. The included mounting brackets allow mounting the switch in a variety of locations and orientations.
5. **Connect power to the switch (*page 2-13*).** Once the switch is mounted, plug it in to the nearby main power source.
6. **Connect the network devices (*page 2-14*).** Using the appropriate network cables, connect the network devices to the switch ports.
7. **Connect a console to the switch (*optional, on Series 2500 switches only—page 2-15*).** For your Series 2500 switch, you may wish to modify the switch's configuration, for example, to configure an IP address so it can be managed using a web browser, from an SNMP network management station, or through a Telnet session. Configuration changes can be made easily by using the included console cable to connect a PC to the switch's console port.

At this point, your switch is fully installed. See the rest of this chapter if you need more detailed information on any of these installation steps.

Installation Precautions:

Follow these precautions when installing your HP Series 2300 and 2500 switches.

Warning

- The rack or cabinet should be adequately secured to prevent it from becoming unstable and/or falling over.

  Devices installed in a rack or cabinet should be mounted as low as possible, with the heaviest devices at the bottom and progressively lighter devices installed above.

Cautions

- Make sure that the power source circuits are properly grounded, then use the power cord supplied with the switch to connect it to the power source.
- If your installation requires a different power cord than the one supplied with the switch, be sure to use a power cord displaying the mark of the safety agency that defines the regulations for power cords in your country. The mark is your assurance that the power cord can be used safely with the switch.
- When installing the switch, note that the AC outlet should be near the switch and should be easily accessible in case the switch must be powered off.
- Ensure that the switch does not overload the power circuits, wiring, and over-current protection. To determine the possibility of overloading the supply circuits, add together the ampere ratings of all devices installed on the same circuit as the switch and compare the total with the rating limit for the circuit. The maximum ampere ratings are usually printed on the devices near the AC power connectors.
- Do not install the switch in an environment where the operating ambient temperature might exceed 55°C (131°F).
- Make sure the air flow around the sides and back of the switch is not restricted.
- Make sure that if no transceivers are installed in the transceiver slots, the cover plates are installed to cover the slots. Cover plates are required for safe operation, and to ensure proper switch cooling.

1. Prepare the Installation Site

- **Cabling Infrastructure** - Ensure that the cabling infrastructure meets the necessary network specifications. See the following table for cable types and lengths, and see appendix B, "Cables and Connectors" for more information:

Table 2-1. Summary of Cable Types to Use With the Switch

Port Type	Cable Type	Length Limits
	Twisted-Pair Cables	
10/100Base-TX	• **10 Mbps operation:** Category 3, 4, or 5, 100-ohm unshielded twisted-pair (UTP) • **100 Mbps operation:** Category 5, 100-ohm UTP or shielded twisted-pair (STP) cable.	100 meters **Note:** Since the 10Base-T operation is through 10/100Base-TX ports, if you ever want to upgrade the ports to 100Base-T, it would be best to cable the ports initially with category 5 cable. The 10/100-Base-TX ports on the Series 2300 and 2500 switches include the "**HP Auto-MDIX**" feature, which allows you to use either straight-through or crossover twisted-pair cables for connecting to *any* network devices including end nodes, such as computers, or to other switches, hubs, and routers.
100/1000Base-T (on the 100/1000-T Transceiver)	**For either 100 Mbps or 1000 Mbps operation:** Category 5 or better, 100-ohm UTP or shielded twisted-pair (STP) balanced cable. For 1000 Mbps (gigabit) operation, Category 5E cabling or better is recommended. **Note:** For 1000 Mbps operation, all four wire pairs are used for data transmission.	100 meters **Note:** The HP ProCurve 100/1000-T Transceiver is compatible with the IEEE 802.3ab standard including the "Auto MDI/MDI-X" feature, which allows you to use either straight-through or crossover twisted-pair cables for connecting to any network devices including end nodes, such as computers, or to other switches, hubs, and routers.

Port Type	Cable Type	Length Limits
	Fiber Optic Cables	
100Base-FX (on the 100-FX Transceiver)	62.5/125 µm or 50/125 µm core/cladding diameter, graded-index, multimode fiber-optic cables that are fitted with SC connectors	• 2 kilometers for full-duplex connections
Gigabit-SX (on the Gigabit-SX transceivers)	62.5/125 µm or 50/125 µm core/cladding diameter, graded-index, multimode fiber-optic cables that are fitted with SC connectors	• 62.5 µm cable: – 160 MHz*km = 220 meters – 200 MHz*km = 275 meters • 50 µm cable: – 400 MHz*km = 500 meters – 500 MHz*km = 550 meters
Gigabit-LX (on the Gigabit-LX transceivers)	Single-mode cables fitted with SC connectors. 62.5/125 µm or 50/125 µm core/cladding diameter, graded-index, multimode fiber-optic cables may also be used, but a mode conditioning patch cord may be needed — see the *Installation Guide* that came with the transceiver for more information.	• single-mode cable - 5 kilometers • multimode cable - 550 meters

- **Installation Location** - Before installing the switch, plan its location and orientation relative to other devices and equipment:
  - In the front of the switch, leave at least 7.6 cm (3 inches) of space for the twisted-pair and fiber-optic cabling.
  - In the back of the switch, leave at least 3.8 cm (1 1/2 inches) of space for the power cord.
  - On the sides of the switch, leave at least 7.6 cm (3 inches) for cooling, except if the switch is installed in an open EIA/TIA rack.

2. Install Transceivers (optional)

Install a transceiver into one or both of the slots as shown in the illustration below. For installation details, see the instructions in the *Installation Guide* that comes with the transceiver.

The slot cover can be removed with either a flat-bladed or Torx T-10 screwdriver. Keep the slot cover for future use.

Transceiver Notes

- Any of the supported Gbps (gigabit) and 100 Mbps transceivers can be installed in the slots in the Series 2300 and 2500 switches. See "Supported Transceivers" below.
- ***Make sure the transceivers are fully installed and that you screw in the retaining screws to secure the transceivers in place.***
- If you do not install a transceiver in one or both of the slots, make sure that the slot cover plate(s) is still attached over the slot for safe operation and proper switch cooling.
- The transceivers can be installed while the switch is powered on. ***Once the transceivers are installed, reset the switch by pressing the Reset button on the front of the switch.*** This resets/reboots the switch which initializes and activates the transceiver. Until the switch is reset/rebooted, the transceiver will not be operational. If you install the transceivers when the switch is powered off, powering on the switch after the installation will initialize the transceivers.
- In the Series 2500 and 2300 switches, the transceivers can operate only at full duplex. Half duplex operation is not supported.

Supported Transceivers. When this manual was printed, the supported transceivers include the following:

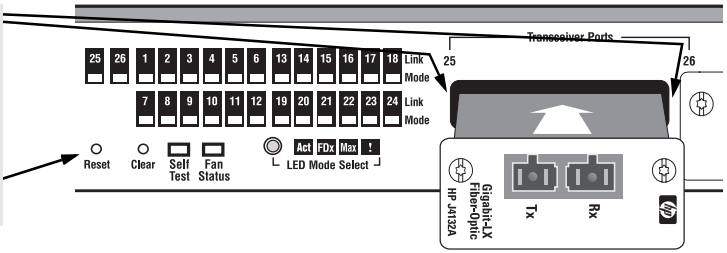
- HP ProCurve Gigabit-SX Transceiver (J4131A)
- HP ProCurve Gigabit-LX Transceiver (J4132A)
- HP ProCurve 100/1000-T Transceiver (J4834A)
- HP ProCurve 100-FX SC Transceiver (J4853A)
- HP ProCurve Stacking Transceiver (part of the HP ProCurve Switch Gigabit Stacking Kit—J4116A)

Note

The Gigabit-SX, and Gigabit-LX transceivers are Class 1 Laser Products (Laser Klasse 1). They comply with IEC 825-2: 1993.

Installing a Transceiver in the Switch

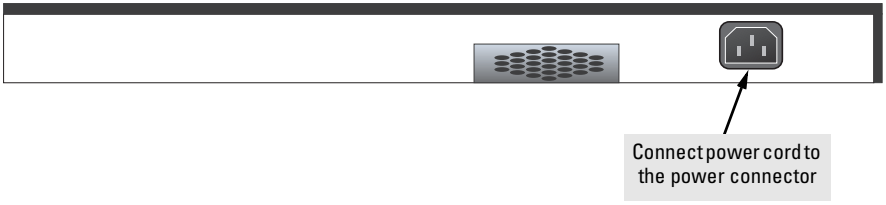
1. Insert transceiver into the guides and slide it in until it stops.
2. Press in firmly until the transceiver is flush with the face of the switch.
3. Tighten the retaining screws on the transceiver until they secure, but do not overtighten them.
4. Press the Reset button to reset/reboot the switch and initialize the transceivers.



3. Verify the Switch Passes Self Test

Before mounting the switch in its network location, you should first verify that it is working properly by plugging it into a power source and verifying that it passes its self test.

1. Connect the power cord supplied with the switch to the power connector on the back of the switch, and then into a properly grounded electrical outlet.

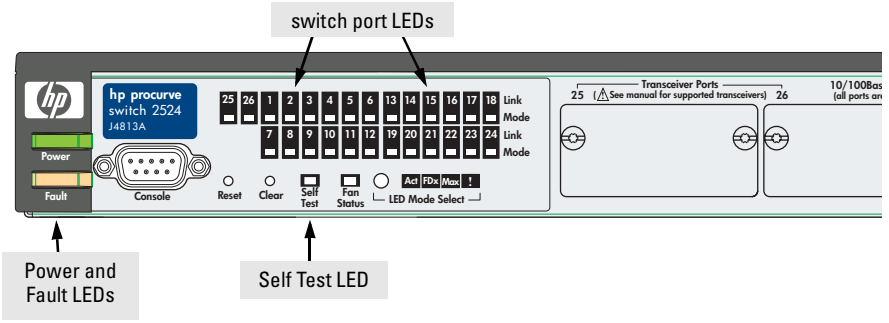


Note

The Series 2300 and 2500 switches do not have a power switch. They are powered on when the power cord is connected to the switch and to a power source. For safety, the power outlet should be located near the switch installation.

If your installation requires a different power cord than the one supplied with the switch, be sure to use a power cord displaying the mark of the safety agency that defines the regulations for power cords in your country. The mark is your assurance that the power cord can be used safely with the switch.

2. Check the LEDs on the switch as described below.



When the switch is powered on, it performs its diagnostic self test. Self test takes approximately 40 seconds to complete.

LED Behavior:

During the self test:

- Initially, all the switch and port LEDs are on and stay on for most of the duration of the self test.
- Most of the LEDs go off and then may come on again during phases of the self test. For the duration of the self test, the Self Test LED stays on.

When the self test completes successfully:

- The **Power** and **Fan Status** LEDs remain on.
- The **Fault** and **Self Test** LEDs go off.
- The port LEDs on the front of the switch go into their normal operational mode:
  - If the ports are connected to active network devices, the **Link** LEDs stay on and the **Mode** LEDs behave according to the mode selected. In the default mode (Activity), the Mode LEDs should flicker showing network activity on the port.
  - If the ports are not connected to active network devices, the **Link** and **Mode** LEDs will stay off.

If the LED display is different than what is described above, especially if the **Fault** and **Self Test** LEDs stay on for more than 60 seconds or they start blinking, the self test has not completed correctly. Refer to chapter 3, “Troubleshooting” for diagnostic help.

4. Mount the Switch

After you have verified that the switch passes self test, you are ready to mount the switch in a stable location. The Series 2300 and 2500 switches can be mounted in these ways:

- in a rack or cabinet
- on a horizontal surface
- on a wall

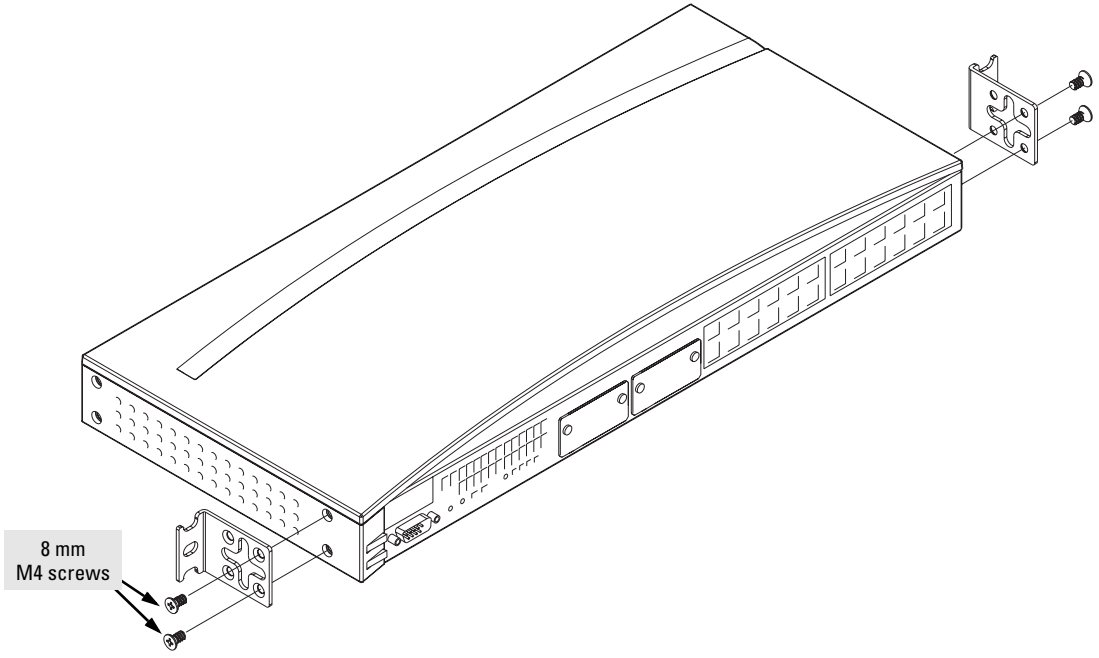
Rack or Cabinet Mounting

The Series 2300 and 2500 switches are designed to be mounted in any EIA-standard 19-inch telco rack or communication equipment cabinet.

Warning

For safe operation, please read the mounting precautions on page 2-3, before mounting a switch.

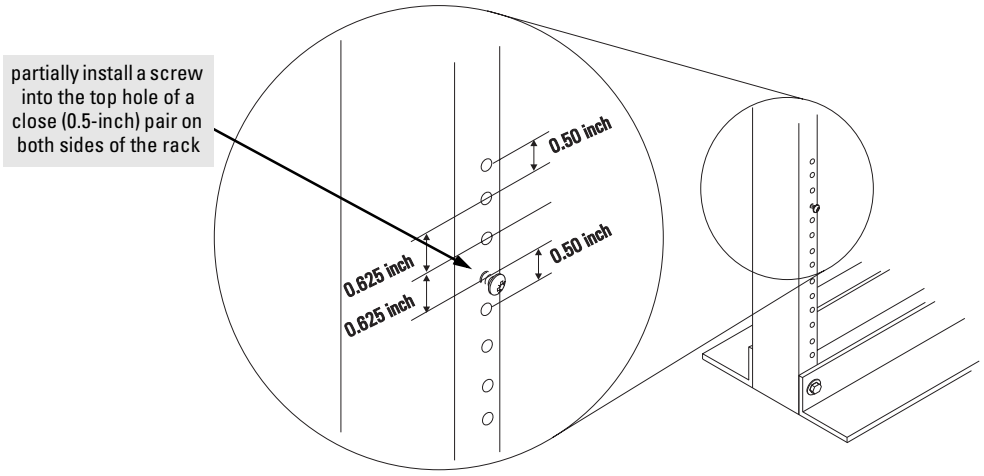
1. Use a number 1 Phillips (cross-head) screwdriver and attach the mounting brackets to the switch with the included 8-mm M4 screws.



Note

Steps 2, 3, and 4 below describe a convenient method of mounting the switch in a rack by placing it on two screws that you first install in the rack. You may, instead, just hold the switch with attached brackets up to the rack and move it vertically until rack holes line up with the bracket notches, then insert and tighten the four screws holding the brackets to the rack.

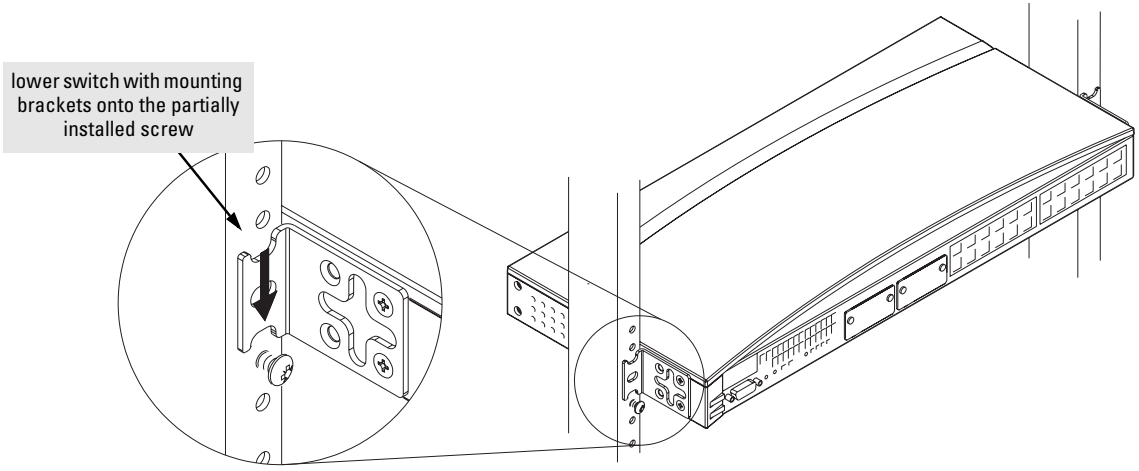
2. Partially install a screw (5/8-inch number 12-24) into the top hole of a pair of holes that are 0.5 inches apart in each rack/cabinet upright as shown in the illustration below. Ensure that the screws are at the same level in each upright.


partially install a screw into the top hole of a close (0.5-inch) pair on both sides of the rack
0.50 inch
0.625 inch
0.625 inch
0.50 inch

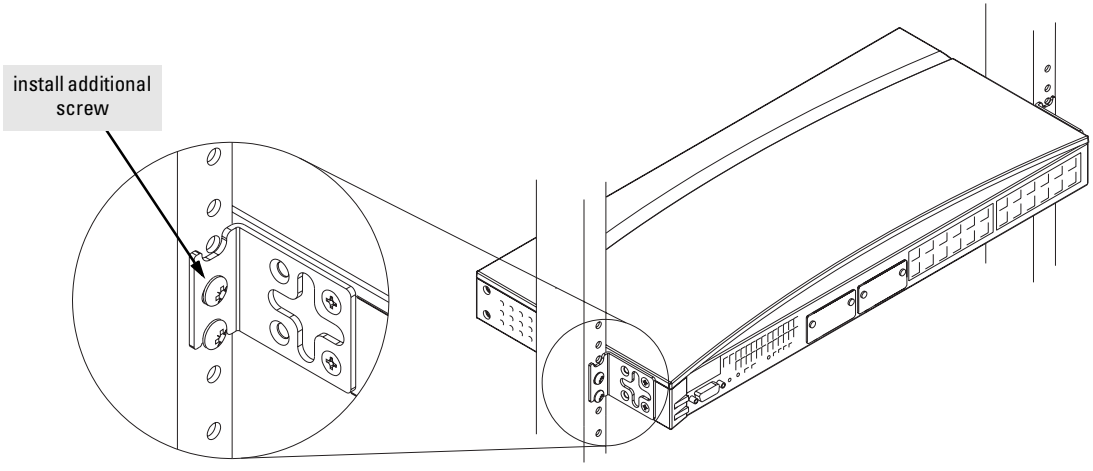
Note

If you are installing the switch in an equipment cabinet, in place of the 12-24 screws supplied with the switch, use the clips and screws that came with the cabinet. Plan which four holes you will be using in the cabinet and install all four clips and partially install the two bottom screws (as shown in the illlustration above) before proceeding to step 3.

3. Place the switch in the rack and lower it so the notches in the bottom of the bracket slide onto the screws, then tighten these screws.



4. Install the other number 12-24 screw through the hole in each bracket. Tighten these screws.



Horizontal Surface Mounting

Place the switch on a table or other horizontal surface. The switch comes with rubber feet in the accessory kit that can be used to help keep the switch from sliding on the surface. Attach the rubber feet to the four corners on the bottom of the switch within the embossed angled lines. Use a sturdy surface in an uncluttered area. You may want to secure the networking cables and switch power cord to the table leg or other part of the surface structure to help prevent tripping over the cords.

Caution Make sure the air flow is not restricted around the sides and back of the switch.

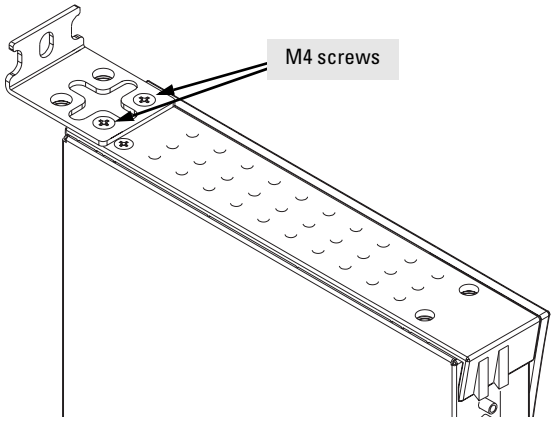
Wall Mounting

You can mount the switch on a wall as shown in the illustrations on the next page.

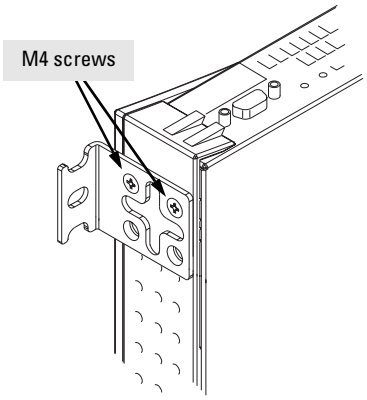
Caution The switch should be mounted only to a wall or wood surface that is at least 1/2-inch plywood or its equivalent.

1. Use a #1 Phillips (cross-head) screwdriver and attach the mounting brackets to the switch with the included 8-mm M4 screws.

For "Bookshelf" Wall Mounting

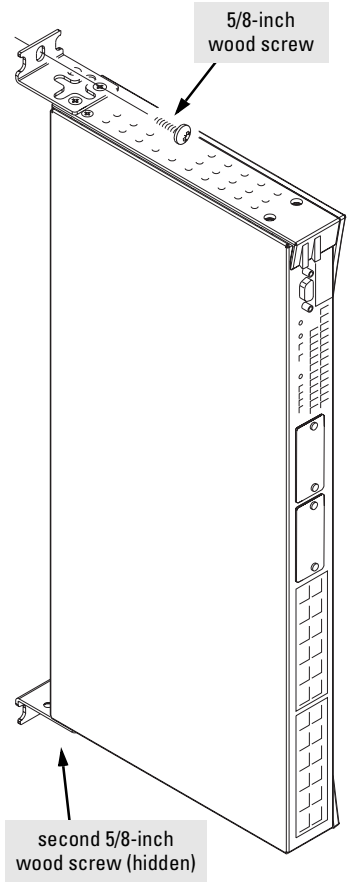


For "Flat" Wall Mounting

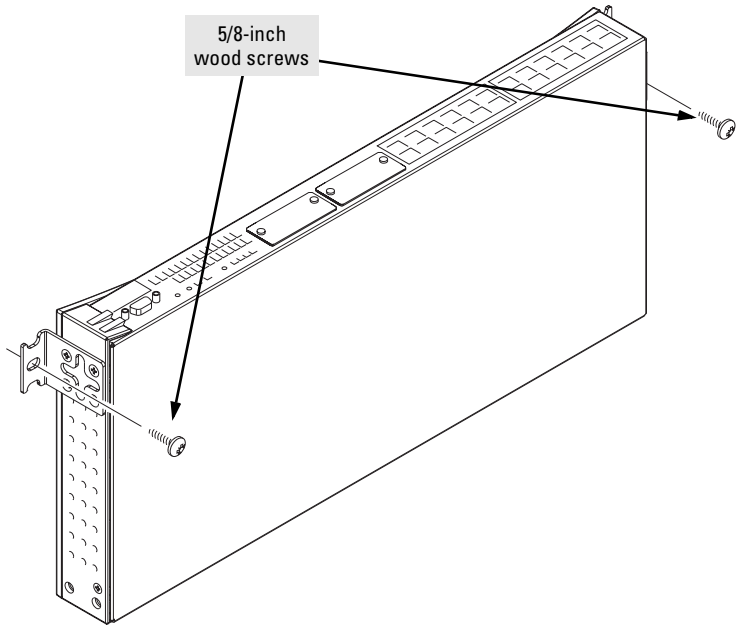


2. Attach the switch to the wall or wood surface with two 5/8-inch number 12 wood screws (not included).

For "Bookshelf" Wall Mounting



For "Flat" Wall Mounting



5. Connect the Switch to a Power Source

1. Plug the included power cord into the switch's power connector and into a nearby AC power source.
2. Re-check the LEDs during self test. See "LED Behavior" on page 2-8.

6. Connect the Network Cables

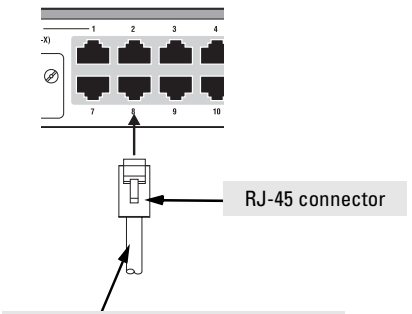
Connect the network cables, described under "Cabling Infrastructure" (page 2-4), from the network devices or your patch panels to the fixed RJ-45 ports on the switch or the ports on any transceivers you have installed in the switch.

Using the RJ-45 Connectors (10/100Base-TX ports)

To connect:
Push the RJ-45 plug into the RJ-45 jack until the tab on the plug clicks into place. When power is on for the switch and for the connected device, the Link LED for the port should light to confirm a powered-on device (for example, an end node) is at the other end of the cable.

If the Link LED does *not* go on when the network cable is connected to the port, see "Diagnosing With the LEDs" in chapter 3, "Troubleshooting".

To disconnect:
Press the small tab on the plug and pull the plug out of the jack.



Unshielded twisted-pair cable:

- Category 3, 4, or 5 for 10 Mbps ports
- Category 5 only for 100 Mbps ports

Maximum distance: 100 meters

Connecting Cables to the Transceivers

If you have any transceivers installed in the switch, the type of network connections you will need to use depends on the type of transceivers you have installed. See the documentation accompanying the transceivers for cabling configurations and procedures for those transceivers.

The transceiver documentation will also cover troubleshooting procedures for connections to the transceivers, but, in general for all the switch ports, when a network cable from an active network device is connected to the port, the Link LED for that port should go on. If the Link LED does *not* go on when the network cable is connected to the port, see "Diagnosing With the LEDs" in chapter 3, "Troubleshooting".

7. (Optional) Connect a Console to the Switch 2500

The Series 2500 switches have a full-featured, easy to use console interface for performing the following tasks:

- Monitor switch and port status and observe network activity statistics
- Modify the switch's configuration to optimize switch performance, enhance network traffic control, and improve network security
- Read the event log and access diagnostic tools to help in troubleshooting
- Download new software to the switch
- Add passwords to control access to the switch from the console, web browser interface, and network management stations

The console can be accessed through these methods:

- **Out-of-band:** The Series 2500 switches come with a serial cable for connecting a PC or VT-100 terminal, to be used as a console, directly to the switch.
- **In-Band:** Access the console using Telnet from a PC or UNIX station on the network, and a VT-100 terminal emulator. This method requires that you first configure the switch with an IP address and subnet mask by using either out-of-band console access or through DHCP/Bootp. See the section "Getting Started With Switch Configuration" later in this chapter, and the *Management and Configuration Guide* that came with your switch for more information on IP addressing and on starting a Telnet session.

The Series 2500 switches can simultaneously support one out-of-band console session through the Console Port and one in-band Telnet console session.

Terminal Configuration

To connect a console to the switch, configure the PC terminal emulator as a DEC VT-100 (ANSI) terminal or use a VT-100 terminal, and configure either one to operate with these settings:

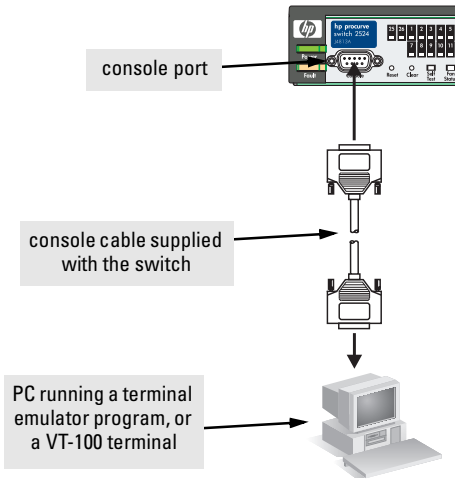
- any baud rate from 1200 to 115200 (the switch senses the speed)
- 8 data bits, 1 stop bit, no parity, and flow control set to None
- For the Windows Terminal program, also disable (uncheck) the "Use Function, Arrow, and Ctrl Keys for Windows" option
- For the Hilgrave HyperTerminal program, select the "Terminal keys" option for the "Function, arrow, and ctrl keys act as" parameter.

If you want to operate the console using a different configuration, make sure you change the settings on both the terminal and on the switch so they are compatible. Change the switch settings first, then change the terminal settings, then reboot the switch and reestablish the console session.

Connecting a Console

To connect a console to the switch, follow these steps:

1. Connect the PC or terminal to the switch's Console Port using the console cable included with the Series 2500 switch. (If your PC or terminal has a 25-pin serial connector, first attach a 9-pin to 25-pin straight-through adapter at one end of the console cable.)
2. Turn on the terminal or PC's power and, if using a PC, start the PC terminal program.



3. Press Enter two or three times and you will see the copyright page and the message "Press any key to continue". Press a key, and you will then see the switch console command (CLI) prompt, for example:

   HP ProCurve Switch 2524#

If you want to continue with console management of the switch at this time, see the next section, "Getting Started With Switch Configuration" for some simple configuration steps, and refer to the *Management and Configuration Guide* that came with your switch for more detailed configuration information.

Getting Started With Switch Configuration (Series 2500 Switches Only)

This section is a guide for using the console Switch Setup screen to quickly assign an IP (Internet Protocol) address and subnet mask to the switch, set a Manager password, and, optionally, configure other basic features.

For more information on using the switch console and the other switch management interfaces: the web browser interface and the SNMP management tool, HP TopTools for Hubs & Switches, please see the *Management and Configuration Guide* that came with your Series 2500 switch.

Recommended Minimal Configuration

In the factory default configuration, the switch has no IP (Internet Protocol) address and subnet mask, and no passwords. In this state, it can be managed only through a direct console connection. To manage the switch through in-band (networked) access, you should configure the switch with an IP address and subnet mask compatible with your network. Also, you should configure a Manager password to control access privileges from the console and web browser interface. Other parameters in the Switch Setup screen can be left at their default settings or you can configure them with values you enter.

Many other features can be configured through the switch's console interface, to optimize the switch's performance, to enhance your control of the network traffic, and to improve network security. Once an IP address has been configured on the switch, these features can be accessed more conveniently through a remote Telnet session, through the switch's web browser interface, and from an SNMP network management station running a network management program, such as HP TopTools for Hubs & Switches. For a listing of switch features available with and without an IP address, refer to "How IP Addressing Affects Switch Operation" in the *Management and Configuration Guide* that came with your Series 2500 switch.

For more information on IP addressing, refer to "IP Configuration" in the *Management and Configuration Guide*.

Note

By default, the switch is configured to acquire an IP address configuration from a DHCP or Bootp server. To use DHCP/Bootp instead of the manual method described in this chapter, see "DHCP/Bootp Operation" in the *Management and Configuration Guide* that came with your switch.

Using the Console Setup Screen

The quickest and easiest way to minimally configure the switch for management and password protection in your network is to use a direct console connection to the switch, start a console session, and access the Switch Setup screen.

1. Using the method described in the preceding section, connect a terminal device to the switch and display the switch console command (CLI) prompt (the default display).

   The CLI prompt appears displaying the switch model number:

   HP ProCurve Switch 2524#

2. At the prompt, enter the **setup** command to display the Switch Setup screen. The following illustration shows the Setup screen with the default settings.

```
HP ProCurve Switch 2524                                  1-Jan-2000   0:13:11
========================== CONSOLE - MANAGER MODE ============================
                                Switch Setup

  System Name : HP ProCurve Switch 2524
  System Contact :
  Manager Password :                    Confirm Password :
  Logon Default : CLI                   Time Zone [0] : 0
  Community Name : public               Spanning Tree Enabled [No] : No

  Default Gateway :
  TimeP Config [DHCP] : DHCP
  IP Config [DHCP/Bootp] : DHCP/Bootp
  IP Address  :
  Subnet Mask :




 Actions->   Cancel     Edit     Save     Help

Enter System Name - up to 25 characters.
Use arrow keys to change field selection, <Space> to toggle field choices,
and <Enter> to go to Actions.
```

3. Use the Tab key to select the **Manager Password** field and enter a manager password of up to 16 characters.
4. Tab to the **IP Config (DHCP/Bootp)** field and use the Space bar to select the **Manual** option.
5. Tab to the **IP Address** field and enter the IP address that is compatible with your network.
6. Tab to the **Subnet Mask** field and enter the subnet mask used for your network.
7. Press Enter, then S (for **Save**).

Here is some information on the fields in the Setup screen. For more information on these fields, see the *Management and Configuration Guide* that came with your switch:

Parameter	Default	
System Name	blank	Optional; up to 25 characters, including spaces
System Contact	blank	Optional; up to 48 characters, including spaces
Manager Password	blank	Recommended; up to 16 characters (no blank spaces)
Logon Default	CLI	The default setting selects the command line interface for console access. The alternative is the menu interface.
Time Zone	0 (none)	Optional; 1440 to -1440. The number of minutes your location is to the West (+) or East (-) of GMT.
Community Name	public	Default setting recommended.
Spanning Tree Enabled	No	Default setting recommended unless STP is already running on your network or the switch will be used in complex network topologies.
Default Gateway	blank	Optional; Enter the IP address of the next-hop gateway node if network traffic needs to be able to reach off-subnet destinations.
TimeP Config	DHCP	Optional; The method the switch uses to acquire the TimeP server address.
IP Config (DHCP/Bootp)	DHCP/Bootp	Set to Manual unless a DHCP/Bootp server is used on your network to configure IP addressing.
IP Address	xxx.xxx.xxx.xxx	Recommended; If you set IP Config to Manual, then enter an IP address compatible with your network.
Note: The IP address and subnet mask assigned for the switch must be compatible with the IP addressing used in your network. For more information on IP addressing, see the *Management and Configuration Guide* that came with your switch.		
Subnet Mask	xxx.xxx.xxx.xxx	Recommended; If you entered an IP address, then enter a subnet mask compatible with your network.

The switch is now configured with a Manager password, IP address, and subnet mask, and can be accessed through your network using Telnet, the web browser interface, or an SNMP-based network management tool such as HP TopTools for Hubs & Switches.

To Recover from a Lost Manager Password: If you cannot start a console session at the manager level because of a lost Manager password, you can clear all passwords and user names by getting physical access to the switch and pressing and holding the Clear button for a full second.

Where to Go From Here

The above procedure configures your switch with a Manager password, IP address, and subnet mask. With the proper network connections, you can now manage the switch from a PC equipped with Telnet and/or a web browser or from an SNMP network management station.

Some basic information on managing your switch is included in the next section. For more information on the console, web browser, and SNMP management interfaces and all the features that can be configured on the Series 2500 switches, please see the *Management and Configuration Guide* that came with your Series 2500 switch.

Using the IP Address for Remote Switch Management (Series 2500 Switches Only)

With your Series 2500 switch, you can use the switch's IP address to manage the switch from any PC that is on the same subnet as the switch. You can use either a Telnet session or a standard web browser to manage the switch.

Starting a Telnet Session

To access the switch through a Telnet session, follow these steps:

1. Make sure the switch is configured with an IP address and that the switch is reachable from the PC that is running the Telnet session (for example, by using a Ping command to the switch's IP address).
2. Start the Telnet program on a PC that is on the same subnet as the switch and connect to the switch's IP address.
3. You will see the copyright page and the message "Press any key to continue". Press a key, and you will then see the switch console command (CLI) prompt, for example:

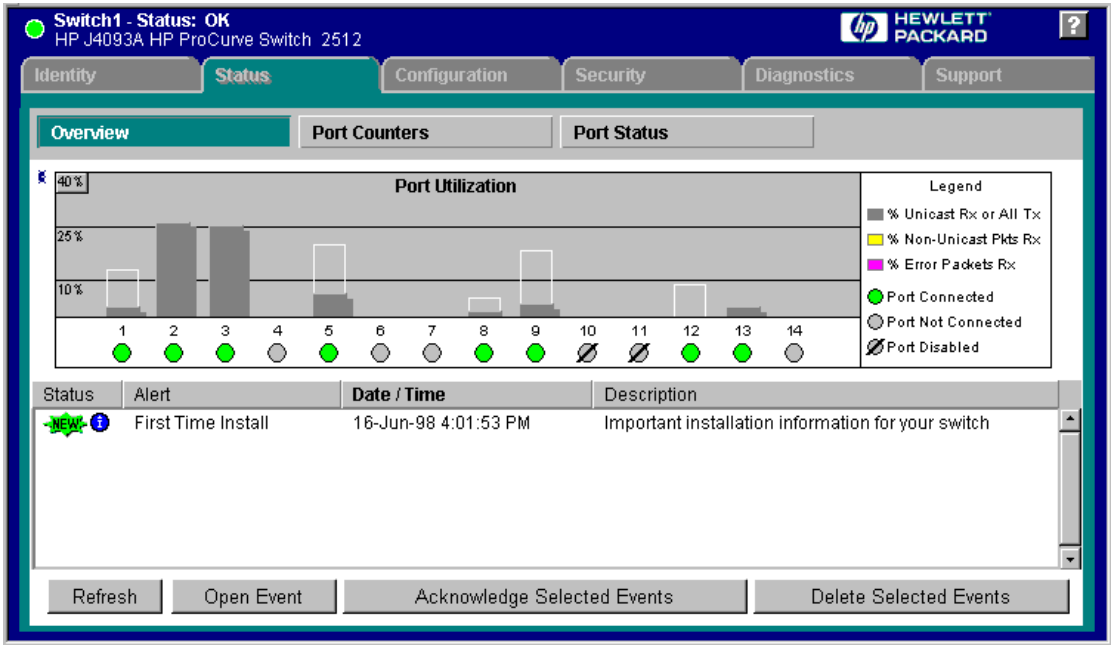
   HP ProCurve Switch 2524#

   Enter **help** or **?** to see a list of commands that can be executed at the prompt. Entering any command followed by **help** provides more detailed context help information about the command.

Starting a Web Browser Session

Your Series 2500 switch can be managed through a graphical interface that you can access from any PC or workstation on the network by running your web browser and typing in the switch's IP address as the URL. No additional software installation is required to make this interface available; it is included in the switch's onboard software.

A typical web browser interface screen is shown in the next illustration.

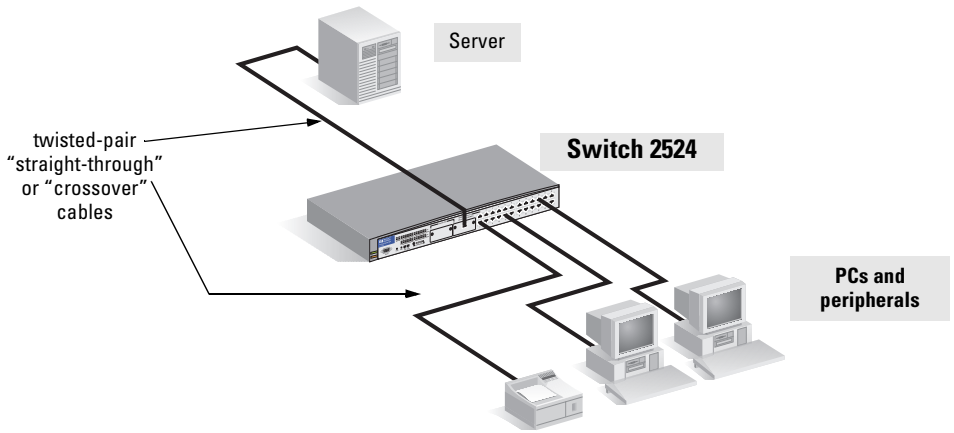


For more information on using the web browser interface, please see the *Management and Configuration Guide* that came with your Series 2500 switch. An extensive help system is also available for the web browser interface. To access the help system though, the subnet on which the switch is installed must have access to the internet, or HP TopTools for Hubs & Switches needs to be installed on a network management station that is on the subnet.

Sample Network Topologies

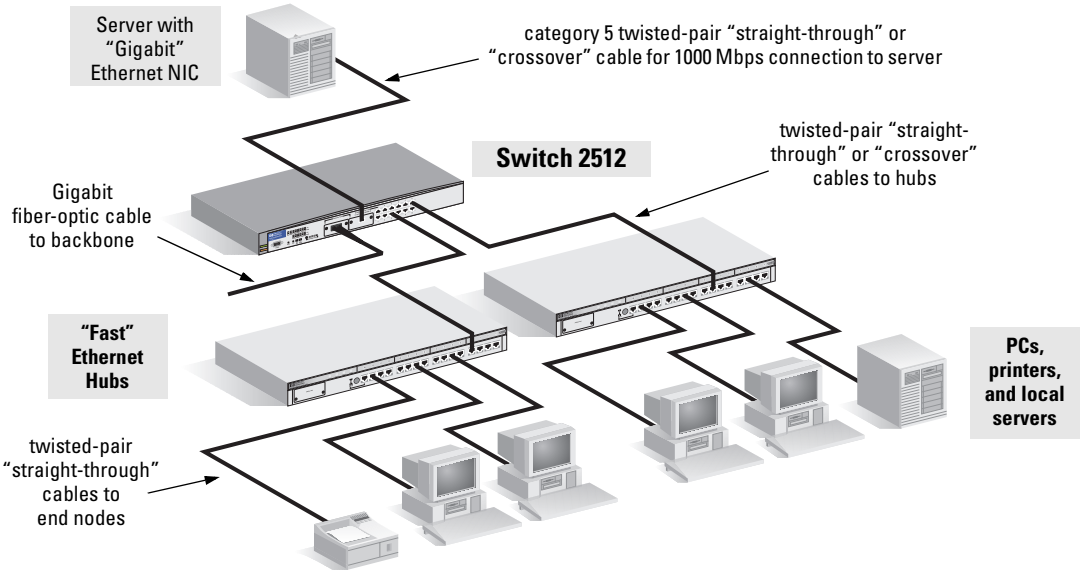
This section shows you a few sample network topologies in which the Series 2300 and 2500 switches are implemented. For more topology information, see the HP network products World Wide Web site, *http://www.hp.com/go/hpprocurve*.

As a Desktop Switch



The Series 2300 and 2500 switches are designed to be used primarily as desktop switches to which end nodes, printers and other peripherals, and servers are directly connected, as shown in the above illustration. Notice that the end node devices are connected to the switch by "straight-through" or "crossover" twisted-pair cables. Either cable type can be used because of the "HP Auto-MDIX" feature on the Series 2300 and 2500 switches.

As a Segment Switch


Server with "Gigabit" Ethernet NIC
category 5 twisted-pair "straight-through" or "crossover" cable for 1000 Mbps connection to server
Switch 2512
twisted-pair "straight-through" or "crossover" cables to hubs
Gigabit fiber-optic cable to backbone
"Fast" Ethernet Hubs
PCs, printers, and local servers
twisted-pair "straight-through" cables to end nodes

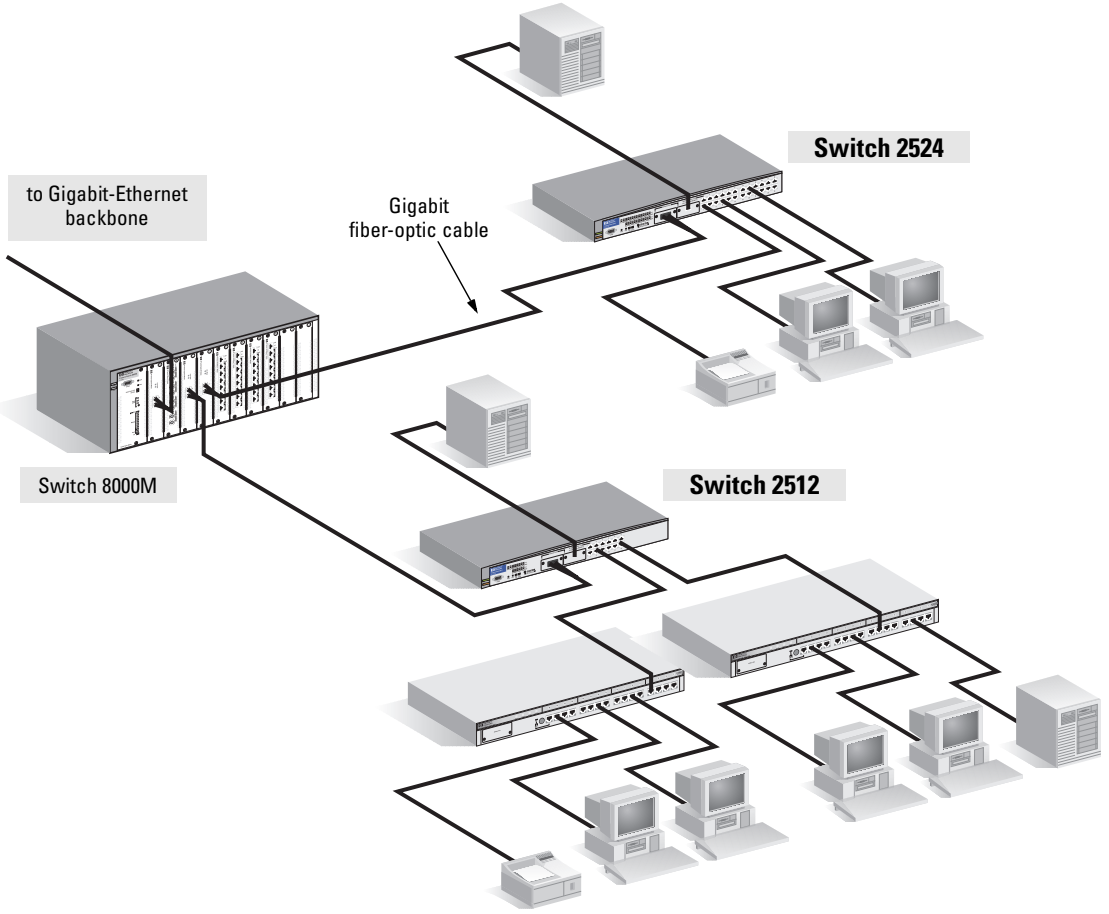
The Series 2300 and 2500 switches also work well as segment switches. That is, with their high performance, they can be used for interconnecting network segments—simply connect the network hubs that form those segments to the switches, or you can also connect other switches.

In the illustration above, two "Fast" Ethernet hubs with PCs, printers, and local servers attached, are both connected to a Switch 2512. The devices attached to the two hubs can now communicate with each other through the switch. They can also all communicate with the server that is connected to the switch through a 100/1000-T Transceiver installed in the switch.

Because the Series 2300 and 2500 switches have the "HP Auto-MDIX" feature, the connections between the switch and the hubs, and between the switch and end nodes or servers can be through category 5 "straight-through" or "crossover" twisted-pair cable. Category 3 or 4 cable can also be used if the connection is 10 Mbps only. In all cases, the device ports must be configured to auto negotiate the link characteristics for this feature to work.

The switch, in turn, can be connected to a network backbone through fiber-optic cabling connected to a Gigabit-SX/LX transceiver installed in the switch. Now, all the devices on these network segments can access other network resources that are connected elsewhere on the network backbone.

Connecting to a Backbone Switch



The simpler desktop and segment networks shown in the previous two examples can easily be combined and expanded. For example, you could use an HP ProCurve Switch 8000M to interconnect each of your smaller switched workgroups to form a larger switched network. All the devices in this network can communicate with each other. With a Gigabit-SX Module, for example, in the Switch 8000M, the entire switched topology could be connected to a campus backbone, as shown in the illustration above.

Note

In the illustration above, the 1000 Mbps fiber-optic connection between the Switch 2524 and the Switch 8000M is by way of a Gigabit-SX Transceiver installed in the Switch 2524 connected to a Gigabit-SX Module in the Switch 8000M.

Stacking the Switches (Series 2500 only)

The Series 2500 switches can be connected together, through standard network connections, and managed through a single IP address. Up to 16 switches can be connected together in such a "virtual stack".

You identify one of the switches as the "Commander" and give that switch an IP address. Up to 15 other switches in the network can then easily be configured as Members of the stack and managed through the Commander's IP address. The management includes Telnet access and web browser interface access to the Commander and to each Member switch through the Commander.

For more information on stacking your Series 2500 switches, please see the *Management and Configuration Guide* that came with your switch.

Troubleshooting

This chapter describes how to troubleshoot your HP ProCurve Series 2300 and 2500 switches. Note that this document describes troubleshooting mostly from a hardware perspective. You can perform more in-depth troubleshooting on the Series 2500 switches using the software tools available with the switch, including the full-featured console interface, the built-in web browser interface, and HP TopTools for Hubs & Switches, the SNMP-based network management tool. See the Troubleshooting chapter of the *Management and Configuration Guide* included with your Series 2500 switch for more information.

This chapter describes the following:

- basic troubleshooting tips (page 3-1)
- diagnosing with the LEDs (page 3-4)
- Proactive Networking tools (page 3-8)
- hardware diagnostic tests (page 3-9)
- restoring the factory default configuration (page 3-11)
- downloading new code to Series 2300 switches (page 3-12)
- HP Customer Support Services (page 3-13)

Basic Troubleshooting Tips

Most problems are caused by the following situations. Check for these items first when starting your troubleshooting:

- **Faulty or loose cables.** Look for loose or obviously faulty connections. If they appear to be OK, make sure the connections are snug. If that does not correct the problem, try a different cable.
- **Non-standard cables.** Non-standard and miswired cables may cause network collisions and other network problems, and can seriously impair network performance. Use a new correctly-wired cable or compare your cable to the cable in appendix B, “Cables and Connectors” for pinouts and correct cable wiring. A category 5 cable tester is a recommended tool for every 100Base-TX and 1000Base-T network installation.

- **Improper Network Topologies.** It is important to make sure you have a valid network topology. Common topology faults include excessive cable length and excessive repeater delays between end nodes. If you have network problems after recent changes to the network, change back to the previous topology. If you no longer experience the problems, the new topology is probably at fault. Sample topologies are shown at the end of chapter 2 in this book, and some topology configuration guidelines can be found online at the HP ProCurve web site, *http://www.hp.com/go/hpprocurve* under the Technical Library button.

  In addition, you should make sure that your network topology contains ***no data path loops***. Between any two end nodes, there should be only one active cabling path at any time. Data path loops will cause broadcast storms that will severely impact your network performance.

  For your Series 2500 switches, if you wish to build redundant paths between important nodes in your network to provide some fault tolerance, you should enable **Spanning Tree Protocol** support on the switch. This ensures that only one of the redundant paths is active at any time, thus avoiding data path loops. Spanning Tree can be enabled through the switch console, the web browser interface, or HP TopTools for Hubs & Switches.

  The Series 2500 switches also support **Trunking**, which allows multiple network cables to be used for a single network connection without causing a data path loop. See the *Management and Configuration Guide* that came with your Series 2500 switch for more information on Spanning Tree and on Trunking.

- **Connecting to devices that have a fixed full-duplex configuration.** The Series 2300 and 2500 RJ-45 ports are configured as "Auto". That is, when connecting to attached devices, the switch will operate in one of two ways to determine the link speed and the communication mode (half duplex or full duplex):
  - if the connected device is also configured to Auto, the switch will automatically negotiate both link speed and communication mode
  - if the connected device has a fixed configuration, for example 100 Mbps, at half or full duplex, the switch will automatically sense the link speed, but will default to a communication of *half* duplex

  Because the Series 2300 and 2500 switches behave in this way *(in compliance with the IEEE 802.3 standard)*, if a device connected to the switch has a fixed configuration at *full* duplex, the device will not connect correctly to the switch. The result will be high error rates and very inefficient communications between the switch and the device.

Make sure that all devices connected to the Series 2300 and 2500 switches are configured to auto negotiate, or are configured to connect at half duplex (all hubs are configured this way, for example).

- **Check the port configuration (Series 2500 Switches only).** A port on your Series 2500 switch may not be operating as you expect because it has been put into a "blocking" state by Spanning Tree, GVRP (automatic VLANs), or LACP (automatic trunking). (Note that the normal operation of the Spanning Tree, GVRP, and LACP features may put the port in a blocking state.) Or, the port just may have been configured as disabled through software.

  Use the switch console to determine the port's configuration and verify that there is not an improper or undesired configuration of any of the switch features that may be affecting the port. See the *Management and Configuration Guide* that came with your Series 2500 switch for more information.

For more information on possible network problems and their solutions, refer to the technical note "Troubleshooting LAN Performance and Intermittent Connectivity Problems", which can be found on the HP ProCurve web site, *http://www.hp.com/go/hpprocurve* under the Technical Library button.

Diagnosing with the LEDs

Tables 3-1 shows LED patterns on the switch and the switch modules that indicate problem conditions.

1. Check in the table for the LED pattern that you see on your switch.
2. Refer to the corresponding diagnostic tip on the next few pages.

Table 3-1. LED Error Indicators

LED Pattern Indicating Problems						Diagnostic Tips
Power	**Fault**	**Self Test**	**Fan Status**	**Port Link**	**Port Mode LED** (in Attention Mode - !)	
Off with power cord plugged in	*	*	*	*	*	❶
On	Prolonged On	Prolonged On	*	*	*	❷
On	Blinking†	Blinking†	*	*	*	❸
On	Blinking†	Off	Blinking†	*	*	❹
On	Blinking†	Blinking†	*	Blinking†	*	❺
On	Off	Off	*	Off with cable connected	*	❻
On	Off	Off	*	On, but the port is not communicating	*	❼
On	Off	Off	*	Blinking†	*	❽
On	Off	Off	*	On	Flashing frequently	❾

*** This LED is not important for the diagnosis.**
† The blinking behavior is an on/off cycle once every 1.6 seconds, approximately.

Diagnostic Tips:

Tip	Problem	Solution
❶	The switch is not plugged into an active AC power source, or the switch's power supply may have failed.	1. Verify that the power cord is plugged into an active power source and to the switch. Make sure these connections are snug. 2. Try power cycling the switch by unplugging and plugging the power cord back in. 3. If the Power LED is still not on, verify that the AC power source works by plugging another device into the outlet. Or try plugging the switch into a different outlet or try a different power cord. If the power source and power cord are OK and this condition persists, the switch power supply may have failed. Call your HP-authorized LAN dealer, or use the electronic support services from HP to get assistance. See the Customer Support/Warranty booklet for more information.
❷	A switch hardware failure has occurred. All the LEDs will stay on indefinitely.	Try power cycling the switch. If the fault indication reoccurs, the switch may have failed. Call your HP-authorized LAN dealer, or use the electronic support services from HP to get assistance. See the Customer Support/Warranty booklet for more information.
❸	The switch has experienced a software failure during self test.	1. Try resetting the switch by pressing the Reset button on the front of the switch, or by power cycling the switch. 2. If the fault indication reoccurs, attach a console to the switch (as indicated in chapter 2) and configure it to operate at 9600 baud. Then, reset the switch. Messages should appear on the console screen and in the console log identifying the error condition. You can view the console log at that point by selecting it from the console Main Menu. If necessary to resolve the problem, contact your HP-authorized LAN dealer, or use the electronic support services from HP to get assistance. See the Customer Support/ Warranty booklet for more information.
❹	The switch cooling fan may have failed.	Try disconnecting power from the switch and wait a few moments. Then reconnect the power to the switch and check the LEDs again. If the error indication reoccurs, the fan has failed and the switch should be replaced as soon as possible. Contact your HP-authorized LAN dealer, or use the electronic support services from HP to get assistance. See the Customer Support/Warranty booklet for more information.
❺	The port associated with the blinking Link LED has failed self test.	Try power cycling the switch. If the fault indication reoccurs, the switch port may have failed. Call your HP-authorized LAN dealer, or use the electronic support services from HP to get assistance. See the Customer Support/Warranty booklet for more information.

continued on the next page

Tip	Problem	Solution
❻	The network connection is not working properly.	Try the following procedures: • For the indicated port, verify that both ends of the cabling, at the switch and the connected device, are connected properly. • Verify the connected device and switch are both powered *on* and operating correctly. • Verify that you have used the correct cable type for the connection: – For twisted-pair connections to the fixed 10/100 ports or to the port on a 100/1000-T transceiver, if the port is configured to "Auto" (auto negotiate), either "straight-through" or "crossover" cables can be used because of the switch's "HP Auto-MDIX" feature and the Auto MDI/MDI-X feature of the 100/1000-T port. If, however, the switch port is configured with a fixed configuration, for example 100 Mbps/full-duplex, the switch port then operates as MDI-X only, and you must use the correct cable type for the connection. In general, in this case, for connecting an end node to the switch, use "straight- through" cable; for connecting MDI-X ports on hubs or other switches, use "crossover" cable. – For fiber-optic connections, verify that the transmit port on the switch is connected to the receive port on the connected device, and the switch receive port is connected to the transmit port on the connected device. • For 1000Base-T connections, verify that the network cabling complies with the IEEE 802.3ab standard. the cable should be installed according to the ANSI/TIA/EIA-568-A-5 specifications. Cable testing should comply with the stated limitations for Attenuation, Near-End Crosstalk, Far-End Crosstalk, Equal-Level Far-End Crosstalk, and Return Loss. The cable verification process must include all patch cables from any end devices, including the switch, to any patch panels in the cabling path. • Verify that the port has not been disabled through a switch configuration change. You can use the console interface, or, if you have configured an IP address on the switch, use the web browser interface, or HP TopTools for Hubs & Switches network management software to determine the state of the port and re-enable the port if necessary. • If the other procedures don't resolve the problem, try using a different port or a different cable.
❼	The port may be improperly configured, or the port may be in a "blocking" state by the normal operation of the Spanning Tree, LACP, or IGMP features.	Use the switch console to see if the port is part of a dynamic trunk (through the LACP feature) or to see if Spanning Tree is enabled on the switch, and to see if the port may have been put into a "blocking" state by those features. The **show lacp** command displays the port status for the LACP feature; the **show spanning-tree** command displays the port status for Spanning Tree. Also check the Port Status screen using the **show interfaces** command to see if the port has been configured as "disabled". Other switch features that may affect the port operation include VLANs and IGMP. Use the switch console to see how the port is configured for these features. For software troubleshooting tips, see chapter 8, "Troubleshooting" in the *Management and Configuration Guide* that came with your switch. Make sure also, that the device at the other end of the connection is indicating a good link to the switch. If it is not, the problem may be with the cabling between the devices or the connectors on the cable.

Tip	Problem	Solution
❽	A transceiver was installed and the switch has not yet been reset.	When you install transceivers in the transceiver slots, you must reset or reboot the switch so the switch processor can properly initialize and configure the transceiver. The flashing LED informs you that the transceiver is not initialized. The transceiver will not work properly until the switch is reset or rebooted.
❾	Errors are occurring on the network	When you press the Mode LED Select button to light the attention LED (labeled with a !), the Mode LED for each port will flash briefly each time one of these packet types or network events are detected on the port: jabber packet; packet with CRC error; oversized packet; packet with alignment error; packet with symbol error; excessive collision condition; late collision; inbound packet dropped. If you see a large number of these events (the LED is flashing frequently, or is On continuously), the possible causes are the following: • bad quality or improperly wired cabling • invalid topology -- usually a network of excessive length • half/full-duplex mismatch -- For best operation, both the switch port and the connected device should be configured to auto negotiate the link speed and connection mode (full or half duplex). If a fixed configuration is required on the connected device, make sure the switch port is configured to match both the speed AND the duplex setting of the device. (Only Series 2500 switches can be configured -- Series 2300 switch ports are set to auto negotiate the link parameters.) • improperly operating NIC or transceiver in the connected device

Proactive Networking

The HP ProCurve Series 2500 switches have built-in management capabilities that proactively help you manage your network including:

- finding and helping you fix the most common network error conditions (for example, faulty network cabling, and non-standard network topologies)
- informing you of the problem with clear, easy-to-understand messages
- recommending network configuration changes to enhance the performance of your network

The following interfaces provide tests, indicators, and an event log that can be used to monitor the switch and its network connections and to help you take advantage of these proactive networking features:

- HP TopTools for Hubs & Switches - an SNMP-based network management tool that is included with your switch.
- A graphical web browser interface that you can use to manage your switch from a PC running a supported web browser, for example Microsoft Internet Explorer, and Netscape Communicator.
- A full-featured easy-to-use console interface that you can access by connecting a standard terminal or PC running a terminal emulator to the switch's console port. The cable to make that connection is provided with your switch. The console interface is also accessible through a telnet connection.

See the "Troubleshooting" chapter in the *Management and Configuration Guide* that came with your Series 2500 switch for more information on using these software tools to diagnose and manage your switch.

Hardware Diagnostic Tests

Testing the Switch by Resetting It

If you believe that the switch is not operating correctly, you can reset the switch to test its circuitry and operating code. To reset a switch, either:

- Unplug and plug in the power cord (power cycling)
- Press the reset button on the front of the switch

Power cycling the switch and pressing the Reset button both cause the switch to perform its power-on selftest, which almost always will resolve any temporary operational problems. These reset processes also cause any network traffic counters to be reset to zero, and cause the System Up Time timer to reset to zero.

Checking the Switch LEDs

The self test passes if the Fault and Self Test LEDs on the front of the switch go off after approximately 40 seconds. If these LEDs stay on longer than 60 seconds or begin blinking, there may be a problem with the switch.

See “Diagnosing With the LEDs” on page 3-4 for information on interpreting the LED patterns.

Checking Console Messages (Series 2500 switches only)

Useful diagnostic messages may be displayed on the console screen when the switch is reset. As described in chapter 2 under step 7, “Connect a Console to the Switch”, connect a PC running a VT-100 terminal emulator program or a standard VT-100 terminal to the switch’s Console Port and configure it to run at 9600 baud, and with the other terminal communication settings shown on page 2-15. Then, when you reset the switch, note the messages that are displayed. Additionally, you can check the switch event log, which can be accessed from the console using the **show log** command, or from the console Main Menu.

Testing Twisted-Pair Cabling

Network cables that fail to provide a link or provide an unreliable link between the switch and the connected network device may not be compatible with the IEEE 802.3 Type 10Base-T, 100Base-TX, or 1000Base-T standards. The twisted-pair cables attached to the Series 2300 and 2500 switches must be compatible with the appropriate standards. To verify that your cable is compatible with these standards, use a qualified cable test device.

HP also offers a wire testing service. Contact your HP-authorized LAN dealer or your local HP sales office for more information.

Testing Switch-to-Device Network Communications

You can perform the following communication tests to verify that the network is operating correctly between the switch and any connected device that can respond correctly to the communication test.

- Link Test -- a physical layer test that sends IEEE 802.2 test packets to any device identified by its MAC address
- Ping Test -- a network layer test used on IP networks that sends test packets to any device identified by its IP address

These tests can be performed through the switch console interface from a terminal connected to the switch or through a telnet connection, or from the switch's web browser interface. See the *Management and Configuration Guide* that came with your switch for more information.

These tests can also be performed from an SNMP network management station running a program that can manage the switch, for example, HP TopTools for Hubs & Switches.

Testing End-to-End Network Communications

Both the switch and the cabling can be tested by running an end-to-end communications test -- a test that sends known data from one network device to another through the switch. For example, if you have two PCs on the network that have LAN adapters between which you can run a link-level test or Ping test through the switch, you can use this test to verify that the entire communication path between the two PCs is functioning correctly. See your LAN adapter documentation for more information on running a link test or Ping test.

Restoring the Factory Default Configuration (Series 2500 switches only)

As part of your troubleshooting process on the Series 2500 switches, it may become necessary to return the switch configuration to the factory default settings. This process momentarily interrupts the switch operation, clears any passwords, clears the console event log, resets the network counters to zero, performs a complete self test, and reboots the switch into its factory default configuration including deleting the IP address, if one is configured.

Note

This process removes all switch configuration changes that you have made from the factory default settings. This includes, for example, configuration of VLANs, spanning tree, trunks, and stacking. Returning the configuration of these features to their factory default settings (usually disabling them) may result in network connectivity issues.

If the switch has a valid configuration, and you are restoring the factory default settings for a reason other than configuration problems, you should save the switch configuration prior to performing the factory default reset. Then, after the reset and resolution of the original problem, you can restore the saved configuration to the switch. For both the save and restore processes, you can use the console **copy** command. See the switch *Management and Configuration Guide* for more information on this command.

You can restore the factory default configuration either on the switch itself, or through the switch console.

To execute the factory default reset on the switch, perform these steps:

1. Using pointed objects, simultaneously press both the Reset and Clear buttons on the front of the switch.
2. Continue to press the Clear button while releasing the Reset button.
3. When the Self Test LED begins to blink, release the Clear button.

   The switch will then complete its self test and begin operating with its configuration restored to the factory default settings.

To restore the factory default configuration using the console, execute the **delete startup config** command from the console command prompt.

Downloading New Code
(Series 2300 switches only)

If product enhancements occur for the Series 2300 switches, even though they are unmanaged devices, it is possible to download new code to the switch through the Download Port on the front of the switch. The new code would be available on the HP ProCurve web site, **http://www.hp.com/go/hpprocurve**.

Note

New code can be downloaded to the Series 2500 switches through several methods, for product enhancements and new features. Please see the *Management and Configuration Guide* that came with your Series 2500 switch for more information.

These procedures assumes that:

- The Series 2300 switch is connected by a "null modem" serial cable between the Download Port on the front of the switch and the COM1 or COM2 port on a PC or workstation, which is operating as a terminal. You can also use one of the console cables that is supplied with all "managed" HP ProCurve switches and hubs (devices with Console ports).
- The new switch code has been copied from the HP ProCurve web site and is stored on a disk drive in the PC.
- The terminal emulator you are using includes the Xmodem binary transfer feature. (For example, in the Windows 3.1 terminal emulator, you would use the **Send Binary File** option in the **Transfers** dropdown menu.)

To Perform the Download:

1. From the prompt displayed on the terminal, enter the **download** command. The following message is displayed:

   Press 'Enter' and start XMODEM on your host . . .

2. Execute the terminal emulator command(s) to begin Xmodem binary transfer of the file stored on your PC.

   The download can take several minutes, depending on the baud rate used for the transfer.

3. When the download finishes, the switch automatically resets itself and begins running the new switch code.

4. To confirm that the operating system downloaded correctly, from the terminal prompt, enter the **show version** command and verify that the new version is present.

HP Customer Support Services

If you are still having trouble with your switch, Hewlett-Packard offers support 24 hours a day, seven days a week through the use of a number of automated electronic services. See the Customer Support/Warranty booklet that came with your switch for information on how to use these services to get technical support. The HP ProCurve web site, *http://www.hp.com/go/hpprocurve* also provides up-to-date support information.

Additionally, your HP-authorized network reseller can provide you with assistance, both with services that they offer and with services offered by HP.

Before Calling Support

Before calling your networking dealer or HP Support, to make the support process most efficient, you first should have retrieved the following information:

Information Item	Information Location
• product identification	the front of the switch: Switch 2512 (HP J4812A), Switch 2524 (HP J4813A), Switch 2312 (HP J48xxA), or Switch 2324 (HP J48xxA)
• switch's OS (software) version	switch console: **show version** command (Firmware revision field)
• copy of the switch configuration	switch console: **show configuration** command
• copy of the switch Event Log	switch console: **show log** command
• copy of the switch status and counters information, including the detailed counters for the problem port(s)	switch console: **show statistics** command, and **show statistics <*port list*>** command
• copy of your network topology map, including network addresses assigned to the relevant devices	your network records

Specifications

The following specifications apply to both the Series 2300 and 2500 switches.

Physical

Width:	44.2 cm (17.4 in)
Depth:	20.5 cm (8.1 in)
Height:	4.4 cm (1.7 in)
Weight:	2.8 kg (6.2 lbs)

Electrical

The switches automatically adjust to any voltage between 100-127 and 200-240 volts and either 50 or 60 Hz.

AC voltage:	100–127 volts	200–240 volts
Maximum current:	2.4 A	1.2 A
Frequency range:	50/60 Hz	50/60 Hz

Environmental

	Operating	**Non-Operating**
Temperature:	0°C to 55°C (32°F to 131°F)	-40°C to 70°C (-40°F to 158°F)
Relative humidity: (non-condensing)	15% to 95% at 40°C (104°F)	15% to 90% at 65°C (149°F)
Maximum altitude:	4.6 Km (15,000 ft)	4.6 Km (15,000 ft)

Acoustic

Geraeuschemission LwA=54 dB am fiktiven Arbeitsplatz nach DIN 45635 T.19

Noise Emission LwA=54 dB at virtual workspace according to DIN 45635 T.19

Connectors

- The 10/100 Mbps RJ-45 twisted-pair ports are compatible with the IEEE 802.3u 100Base-TX and IEEE 802.3 Type 10Base-T standards.
- The 1000 Mbps RJ-45 twisted-pair port on the 100/1000-T transceiver is compatible with the IEEE 802.3ab standard.
- The 100 Mbps SC fiber-optic port on the 100Base-FX Transceiver is compatible with the IEEE 802.3u 100Base-FX standard.
- The 1000 Mbps SC fiber-optic ports on the Gigabit-SX and Gigabit-LX Transceivers are compatible with the IEEE 802.3z Gigabit-SX and Gigabit-LX standards.

Safety

Complies with:

- EN60950 / IEC 950
- CSA 22.2 No. 950
- NOM-019-SCFI-1994
- UL 1950

Switch Ports and Network Cables

This appendix includes switch connector information and network cable information for cables that should be used with the Series 2300 and 2500 switches, including minimum pin-out information and specifications for twisted-pair cables.

Note Incorrectly wired cabling is the most common cause of problems for LAN communications. HP recommends that you work with a qualified LAN cable installer for assistance with your cabling requirements.

Switch Ports

Twisted Pair

- The fixed RJ-45 10/100Base-TX ports on the switches and the RJ-45 connector on the **100/1000-T Transceiver** accept 100-ohm unshielded and shielded twisted-pair cable with RJ-45 connectors as described on the next page.

Fiber-Optic

- The SC-type connector port on the **100Base-FX Transceiver** transmits at 1300 nm wavelength, and accepts the multimode fiber-optic cables for 100Base-FX described on the next page.
- The SC-type connector port on the **Gigabit-SX Transceiver** transmits at 850 nm wavelength, and accepts the multimode fiber-optic cables for Gigabit-SX described on the next page.
- The SC-type connector port on the **Gigabit-LX Transceiver** transmits at 1300 nm wavelength, and accepts the single mode or multimode fiber-optic cables for Gigabit-LX described on the next page.

Cables

Twisted-Pair

10 Mbps Operation	Category 3, 4, or 5 100-ohm unshielded twisted-pair (UTP) or shielded twisted-pair (STP) cable, complying with IEEE 802.3 Type 10Base-T specifications, fitted with RJ-45 connectors
100 Mbps Operation	Category 5 100-ohm UTP or STP cable, complying with IEEE 802.3u 100Base-TX specifications, fitted with RJ-45 connectors
1000 Mbps Operation	Category 5 100-ohm 4-pair UTP or STP cable, complying with IEEE 802.3ab 1000Base-T specifications, fitted with RJ-45 connectors—Category 5E or better is recommended *(please see "Note on 1000Base-T Cable Requirements", below)*

Note on 1000Base-T Cable Requirements. The Category 5 networking cables that work for 100Base-TX connections should also work for 1000Base-T, as long as all four-pairs are connected. But, for the most robust connections you should use cabling that complies with the Category 5E specifications, as described in Addendum 5 to the TIA-568-A standard (ANSI/TIA/EIA-568-A-5).

Because of the increased speed provided by 1000Base-T (Gigabit-T), network cable quality is more important than for either 10Base-T or 100Base-TX. Cabling plants being used to carry 1000Base-T networking must comply with the IEEE 802.3ab standards. In particular, the cabling must pass tests for Attenuation, Near-End Crosstalk (NEXT), and Far-End Crosstalk (FEXT). Additionally, unlike the cables for 100Base-TX, the 1000Base-T cables must pass tests for Equal-Level Far-End Crosstalk (ELFEXT) and Return Loss.

When testing your cabling, be sure to include the patch cables that connect the switch and other end devices to the patch panels on your site. The patch cables are frequently overlooked when testing cable and they must also comply with the cabling standards.

Fiber-Optic

100Base-FX	62.5/125 µm or 50/125 µm (core/cladding) diameter, graded-index, multimode fiber-optic cables, complying with the ITU-T G.651 and ISO/IEC 793-2 Type A1b or A1a respectively, fitted with MT-RJ connectors
Gigabit-SX	62.5/125 µm or 50/125 µm (core/cladding) diameter, graded-index, multimode fiber-optic cables, complying with the ITU-T G.651 and ISO/IEC 793-2 Type A1b or A1a respectively, fitted with SC or MT-RJ connectors, depending on the transceiver used
Gigabit-LX	single mode fiber-optic cables, complying with the ITU-T G.652 and ISO/IEC 793-2 Type B1 standards, fitted with SC or MT-RJ connectors OR 62.5/125 µm or 50/125 µm (core/cladding) diameter, graded-index, multimode fiber-optic cables, complying with the ITU-T G.651 and ISO/IEC 793-2 Type A1b or A1a respectively, fitted with SC or MT-RJ connectors **Note:** Multimode fiber-optic cabling may be used for a Gigabit-LX application, but a **mode conditioning patch cord** may be needed. See the Installation Guide that came with your transceiver for more information.

Twisted-Pair Cable/Connector Pin-Outs

The HP Auto-MDIX Feature: In the default configuration, "Auto", the fixed 10/100Base-TX ports on the Series 2300 and 2500 switches all automatically detect the type of port on the connected device and operate as either an MDI or MDI-X port, whichever is appropriate. So for any connection, a "straight-through" twisted-pair cable can be used -- *you no longer have to use "crossover" cables*, although "crossover" cables can also be used for any of the connections. (The 100/1000-T transceiver supports the IEEE 802.3ab standard, which includes the "Auto MDI/MDI-X" feature, which operates the same way.)

If you connect a Series 2300 and 2500 switch twisted-pair port to another switch or hub, which typically have MDI-X ports, the Series 2300 and 2500 switch port automatically operates as an MDI port. If you connect it to an end node, such as a server or PC, which typically have MDI ports, the Series 2300 and 2500 switch port operates as an MDI-X port. In all cases, you can use standard "straight through" cables or "crossover" cables.

If you happen to use a correctly wired crossover cable, though, the switch will still be able to automatically detect the MDI/MDI-X operation and link correctly to the connected device.

If the port configuration is changed to any of the fixed configurations though, for example 100 Mbps/full duplex, the port operates as MDI-X only and the correct cable type must be used: for connections to MDI ports, such as end nodes, use a "straight-through" cable; for connections to MDI-X ports, such as on hubs and other switches, use a "crossover" cable.

Other Wiring Rules:

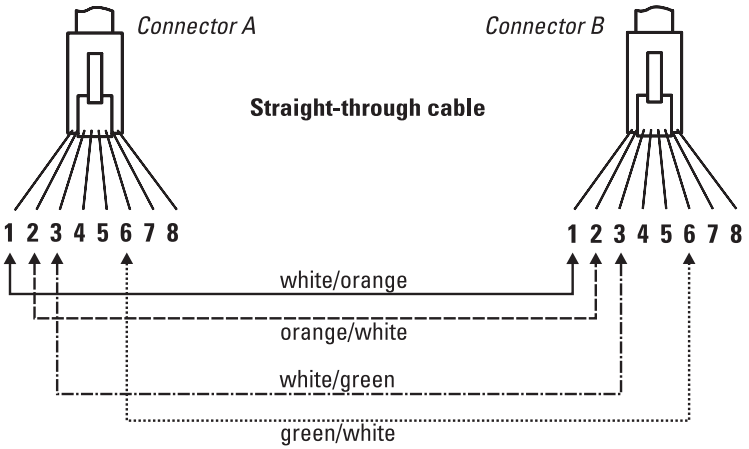
- All twisted-pair wires used for 10 Mbps, and 100 Mbps operation must be twisted through the entire length of the cable. The wiring sequence must conform to EIA/TIA 568-B (not USOC). See "Twisted-Pair Cable Pin Assignments" later in this appendix for a listing of the signals used on each pin.
- For 1000Base-T connections, all four pairs of wires in the cable must be available for data transmission. *Please see "Note on 1000Base-T Cable Requirements" on page B-2 for more information on 1000Base-T cabling.*
- For 10 Mbps connections to the ports, you can use Category 3, 4, or 5 unshielded twisted-pair cable, as supported by the IEEE 802.3 Type 10Base-T standard.
- For 100 Mbps connections to the ports, use 100-ohm Category 5 UTP or STP cable only, as supported by the IEEE 802.3u Type 100Base-TX standard.
- For 1000 Mbps connections, 100-ohm Category 5E or better cabling is recommended.

Straight-Through Twisted-Pair Cable for 10 Mbps or 100 Mbps Network Connections

Because of the HP Auto-MDIX operation of the 10/100 ports on the switches, for all network connections, to PCs, servers or other end nodes, or to hubs or other switches, you can use "straight-through" cables.

If any of these ports are given a fixed configuration, for example 100 Mbps/ Full Duplex, the ports operate as MDI-X ports, and straight-through cables must be then used for connections to PC NICs and other MDI ports.

Cable Diagram



Note

Pins 1 and 2 on connector "A" *must* be wired as a twisted pair to pins 1 and 2 on connector "B".
Pins 3 and 6 on connector "A" *must* be wired as a twisted pair to pins 3 and 6 on connector "B".
Pins 4, 5, 7, and 8 are not used in this application, although they may be wired in the cable.

Pin Assignments

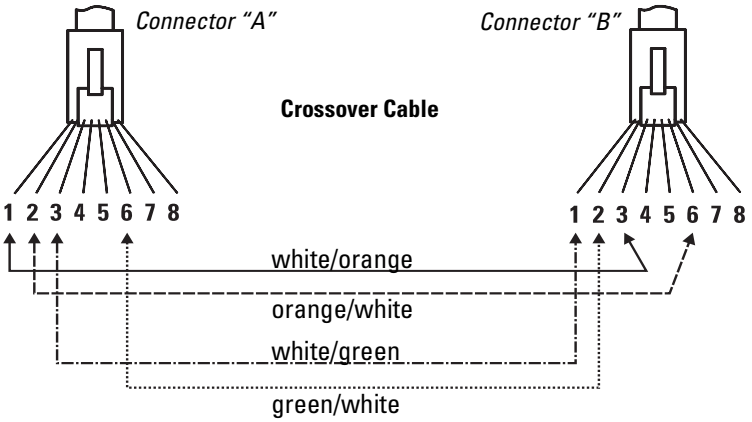
Switch End (MDI-X)		**Computer, Transceiver, or Other End**	
Signal	**Pins**	**Pins**	**Signal**
receive +	1 ←	1	transmit +
receive -	2 ←	2	transmit -
transmit +	3 →	3	receive +
transmit -	6 →	6	receive -

Crossover Twisted-Pair Cable for 10 Mbps or 100 Mbps Network Connection

The HP Auto-MDIX operation of the 10/100 ports on the switches also allows you to use "crossover" cables for all network connections, to PCs, servers or other end nodes, or to hubs or other switches.

If any of these ports are given a fixed configuration, for example 100 Mbps/ Full Duplex, the ports operate as MDI-X ports, and crossover cables *must* be then used for connections to hubs or switches or other MDI-X network devices.

Cable Diagram



Note

Pins 1 and 2 on connector "A" *must* be wired as a twisted pair to pins 3 and 6 on connector "B".
Pins 3 and 6 on connector "A" *must* be wired as a twisted pair to pins 1 and 2 on connector "B".
Pins 4, 5, 7, and 8 are not used in this application, although they may be wired in the cable.

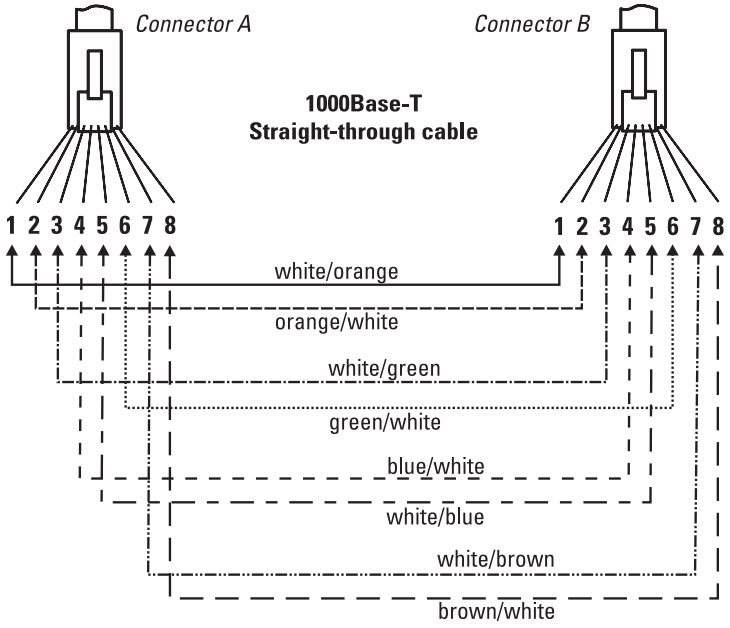
Pin Assignments

Switch End (MDI-X)		**Hub or Switch Port, or Other MDI-X Port End**	
Signal	**Pins**	**Pins**	**Signal**
receive +	1	6	transmit -
receive -	2	3	transmit +
transmit +	3	2	receive -
transmit -	6	1	receive +

Straight-Through Twisted-Pair Cable for 1000 Mbps Network Connections

1000Base-T connections require that all four pairs or wires be connected.

Cable Diagram



Note

Pins 1 and 2 on connector "A" *must* be wired as a twisted pair to pins 1 and 2 on connector "B".
Pins 3 and 6 on connector "A" *must* be wired as a twisted pair to pins 3 and 6 on connector "B".
Pins 4 and 5 on connector "A" *must* be wired as a twisted pair to pins 4 and 5 on connector "B".
Pins 7 and 8 on connector "A" *must* be wired as a twisted pair to pins 7 and 8 on connector "B".

Pin Assignments

For 1000Base-T operation, all four pairs of wires are used for both transmit and receive.

Safety and EMC Regulatory Statements

Safety Information

Documentation reference symbol. If the product is marked with this symbol, refer to the product documentation to get more information about the product.

WARNING — A WARNING in the manual denotes a hazard that can cause injury or death.

CAUTION — A CAUTION in the manual denotes a hazard that can damage equipment.

Do not proceed beyond a WARNING or CAUTION notice until you have understood the hazardous conditions and have taken appropriate steps.

Grounding
These are safety class I products and have protective earthing terminals. There must be an uninterruptible safety earth ground from the main power source to the product's input wiring terminals, power cord, or supplied power cord set. Whenever it is likely that the protection has been impaired, disconnect the power cord until the ground has been restored.

For LAN cable grounding:

- If your LAN covers an area served by more than one power distribution system, be sure their safety grounds are securely interconnected.
- LAN cables may occasionally be subject to hazardous transient voltages (such as lightning or disturbances in the electrical utilities power grid). Handle exposed metal components of the network with caution.

Servicing
There are no user-serviceable parts inside these products. Any servicing, adjustment, maintenance, or repair must be performed only by service-trained personnel.

These products do not have a power switch; they are powered on when the power cord is plugged in.

Informations concernant la sécurité

Symbole de référence à la documentation. Si le produit est marqué de ce symbole, reportez-vous à la documentation du produit afin d'obtenir des informations plus détaillées.

WARNING — Dans la documentation, un WARNING indique un danger susceptible d'entraîner des dommages corporels ou la mort.

CAUTION — Un texte de mise en garde intitulé CAUTION indique un danger susceptible de causer des dommages à l'équipement.

Ne continuez pas au-delà d'une rubrique WARNING ou CAUTION avant d'avoir bien compris les conditions présentant un danger et pris les mesures appropriées.

Cet appareil est un produit de classe I et possède une borne de mise à la terre. La source d'alimentation principale doit être munie d'une prise de terre de sécurité installée aux bornes du câblage d'entrée, sur le cordon d'alimentation ou le cordon de raccordement fourni avec le produit. Lorsque cette protection semble avoir été endommagée, débrancher le cordon d'alimentation jusqu'à ce que la mise à la terre ait été réparée.

Mise à la terre du câble de réseau local:

- si votre réseau local s'étend sur une zone desservie par plus d'un système de distribution de puissance, assurez-vous que les prises de terre de sécurité soient convenablement interconnectées.
- Les câbles de réseaux locaux peuvent occasionnellement être soumis à des surtensions transitoires dangereuses (telles que la foudre ou des perturbations dans le réseau d'alimentation public). Manipulez les composants métalliques du réseau avec précautions.

Aucune pièce contenue à l'intérieur de ce produit ne peut être réparée par l'utilisateur. Tout dépannage, réglage, entretien ou réparation devra être confié exclusivement à un personnel qualifié.

Cet appareil ne comporte pas de commutateur principal ; la mise sous tension est effectuée par branchement du cordon d'alimentation.

Hinweise zur Sicherheit

Symbol für Dokumentationsverweis. Wenn das Produkt mit diesem Symbol markiert ist, schlagen Sie bitte in der Produktdokumentation nach, um mehr Informationen über das Produkt zu erhalten.

WARNING	Eine WARNING in der Dokumentation symbolisiert eine Gefahr, die Verletzungen oder sogar Todesfälle verursachen kann.
CAUTION	CAUTION in der Dokumentation symbolisiert eine Gefahr, die dis Gerät beschädigen kann.
	Fahren Sie nach dem Hinweis WARNING oder CAUTION erst fort, nachdem Sie den Gefahrenzustand verstanden und die entsprechenden Maßnahmen ergriffen haben.

Dies ist ein Gerät der Sicherheitsklasse I und verfügt über einen schützenden Erdungsterminal. Der Betrieb des Geräts erfordert eine ununterbrochene Sicherheitserdung von der Hauptstromquelle zu den Geräteingabeterminals, den Netzkabeln oder dem mit Strom belieferten Netzkabelsatz voraus. Sobald Grund zur Annahme besteht, daß der Schutz beeinträchtigt worden ist, das Netzkabel aus der Wandsteckdose herausziehen, bis die Erdung wiederhergestellt ist.

Für LAN-Kabelerdung:

- Wenn Ihr LAN ein Gebiet umfaßt, das von mehr als einem Stromverteilungssystem beliefert wird, müssen Sie sich vergewissern, daß die Sicherheitserdungen fest untereinander verbunden sind.
- LAN-Kabel können gelegentlich gefährlichen Übergangsspannungen ausgesetzt werden (beispielsweise durch Blitz oder Störungen in dem Starkstromnetz des Elektrizitätswerks). Bei der Handhabung exponierter Metallbestandteile des Netzwerkes Vorsicht walten lassen.

Dieses Gerät enthält innen keine durch den Benutzer zu wartenden Teile. Wartungs-, Anpassungs-, Instandhaltungs- oder Reparaturarbeiten dürfen nur von geschultem Bedienungspersonal durchgeführt werden.

Dieses Gerät hat keinen Netzschalter; es wird beim Anschließen des Netzkabels eingeschaltet.

Considerazioni sulla sicurezza

Simbolo di riferimento alla documentazione. Se il prodotto è contrassegnato da questo simbolo, fare riferimento alla documentazione sul prodotto per ulteriori informazioni su di esso.

WARNING	La dicitura WARNINGdenota un pericolo che può causare lesioni o morte.
CAUTION	La dicituraCAUTION denota un pericolo che può danneggiare le attrezzature.
	Non procedere oltre un avviso di WARNING o di CAUTIONprima di aver compreso le condizioni di rischio e aver provveduto alle misure del caso.

Questo prodotto è omologato nella classe di sicurezza I ed ha un terminale protettivo di collegamento a terra. Dev'essere installato un collegamento a terra di sicurezza, non interrompibile che vada dalla fonte d'alimentazione principale ai terminali d'entrata, al cavo d'alimentazione oppure al set cavo d'alimentazione fornito con il prodotto. Ogniqualvolta vi sia probabilità di danneggiamento della protezione, disinserite il cavo d'alimentazione fino a quando il collegaento a terra non sia stato ripristinato.

Per la messa a terra dei cavi LAN:

- se la vostra LAN copre un'area servita da più di un sistema di distribuzione elettrica, accertatevi che i collegamenti a terra di sicurezza siano ben collegati fra loro;
- i cavi LAN possono occasionalmente andare soggetti a pericolose tensioni transitorie (ad esempio, provocate da lampi o disturbi nella griglia d'alimentazione della società elettrica); siate cauti nel toccare parti esposte in metallo della rete.

Nessun componente di questo prodotto può essere riparato dall'utente. Qualsiasi lavoro di riparazione, messa a punto, manutenzione o assistenza va effettuato esclusivamente da personale specializzato.

Questo apparato non possiede un commutatore principale; si mette scotto tensione all'inserirsi il cavo d'alimentazione.

Consideraciones sobre seguridad

Símbolo de referencia a la documentación. Si el producto va marcado con este símbolo, consultar la documentación del producto a fin de obtener mayor información sobre el producto.

WARNING — Una WARNING en la documentación señala un riesgo que podría resultar en lesiones o la muerte.

CAUTION — Una CAUTION en la documentación señala un riesgo que podría resultar en averías al equipo.

No proseguir después de un símbolo de WARNING o CAUTION hasta no haber entendido las condiciones peligrosas y haber tomado las medidas apropiadas.

Este aparato se enmarca dentro de la clase I de seguridad y se encuentra protegido por una borna de puesta a tierra. Es preciso que exista una puesta a tierra continua desde la toma de alimentación eléctrica hasta las bornas de los cables de entrada del aparato, el cable de alimentación o el juego de cable de alimentación suministrado. Si existe la probabilidad de que la protección a tierra haya sufrido desperfectos, desenchufar el cable de alimentación hasta haberse subsanado el problema.

Puesta a tierra del cable de la red local (LAN):

- Si la LAN abarca un área cuyo suministro eléctrico proviene de más de una red de distribución de electricidad, cerciorarse de que las puestas a tierra estén conectadas entre sí de modo seguro.
- Es posible que los cables de la LAN se vean sometidos de vez en cuando a voltajes momentáneos que entrañen peligro (rayos o alteraciones en la red de energía eléctrica). Manejar con precaución los componentes de metal de la LAN que estén al descubierto.

Este aparato no contiene pieza alguna susceptible de reparación por parte del usuario. Todas las reparaciones, ajustes o servicio de mantenimiento debe realizarlos solamente el técnico.

Este producto no tiene interruptor de potencia; se activa cuando se enchufa el cable de alimentación.

Safety Information (Japan)

安全性の考慮

安全記号

マニュアル参照記号。製品にこの記号がついている場合はマニュアルを参照し、注意事項等をご確認ください。

WARNING　マニュアル中の「WARNING」は人身事故の原因となる危険を示します。

CAUTION　マニュアル中の「CAUTION」は装置破損の原因となる危険を示します。

「WARNING」や「CAUTION」の項は飛ばさないで必ずお読みください。危険性に関する記載事項をよく読み、正しい手順に従った上で次の事項に進んでください。

これは安全性クラスIの製品で保護用接地端子を備えています。主電源から製品の入力配線端子、電源コード、または添付の電源コード・セットまでの間、切れ目のない安全接地が存在することが必要です。もしこの保護回路が損なわれたことが推測されるときは、接地が修復されるまで電源コードを外しておいてください。

LAN ケーブルの接地に関して:

- もし貴社の LAN が複数の配電システムにより電力を受けている領域をカバーしている場合には、それらのシステムの安全接地が確実に相互に結合されていることを確認してください。
- LAN ケーブルは時として危険な過度電圧（例えば雷や、配電設備の電力網での障害）にさらされることがあります。露出した金属部分の取扱いには十分な注意をはらってください。

本製品の内部にはユーザーが修理できる部品はありません。サービス、調整、保守および修理はサービス訓練を受けた専門家におまかせください。

本製品には電源スイッチがありません。電源コードを接続したとき電源入となります。

Safety Information (China)

HP网络产品使用安全手册

使用须知

欢迎使用惠普网络产品，为了您及仪器的安全，请您务必注意如下事项:

1. 仪器要和地线相接，要使用有正确接地插头的电源线，使用中国国家规定 的220V 电源。
2. 避免高温和尘土多的地方，否则易引起仪器内部部件的损坏。
3. 避免接近高温，避免接近直接热源，如直射太阳光、暖气等其它发热体。
4. 不要有异物或液体落入机内，以免部件短路。
5. 不要将磁体放置于仪器附近。

警告

为防止火灾或触电事故，请不要将该机放置于淋雨或潮湿处。

安装

安装辅助管理模块，请参看安装指南。

保修及技术支持

如果您按照以上步骤操作时遇到了困难，或想了解其它产品性能，请按以下 方式与我们联络。

如是硬件故障:

1. 与售出单位或当地维修机构联系。
2. 中国惠普有限公司维修中心地址:
   北京市海淀区知春路49号希格玛大厦
   联系电话: 010-62623888 转 6101
   邮政编码: 100080

如是软件问题:

1. 惠普用户响应中心热线电话: 010-65645959
2. 传真自动回复系统: 010-65645735

EMC Regulatory Statements

U.S.A.

FCC Class A

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause interference to radio communications. Operation of this equipment in a residential area may cause interference in which case the user will be required to correct the interference at his own expense.

Canada

This product complies with Class A Canadian EMC requirements.

Australia/New Zealand

This product complies with Australia/New Zealand EMC Class A requirements.

Japan

VCCI Class A

この装置は、情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）の基準に基づくクラスＡ情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

Korea

사용자 안내문 : A 급기기

이기기는 업무용으로 전자파 적합등록을 받은 기기이오니, 판매자 또는 사용자는 이점을 주의하시기 바라며, 만약 잘못 구입하셨을 때에는 구입한 곳에서 비업무용으로 교환하시기 바랍니다.

Taiwan

警告使用者：這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

European Community

DECLARATION OF CONFORMITY

according to ISO/IEC Guide 22 and EN45014

Manufacturer's Name: Hewlett-Packard Company

Manufacturer's Address: 8000 Foothills Blvd.
Roseville, CA 95747-5502
U.S.A.

declares that the product:

Product Name: HP ProCurve Switch 2512,
HP ProCurve Switch 2524,
HP ProCurve Switch 2312,
HP ProCurve Switch 2324

Model Number: HP J4812A, J4813A, J4817A, J4818A

Accessories: HP J4116A, J4131A, J4132A, J4834A, J4853A

conforms to the following Product Specifications:

Safety: EN60950 (1992) +A1,A2,A3,A4,A11 / IEC 950 (1991) +A1,A2,A3,A4,A11
EN60825-1 (1993) / IEC 825-1 (1993), Class 1
GB4943(1995)

EMC: EN 55022 (1994) / CISPR-22 (1993) Class A
EN50082-1 (1997)
IEC/EN 61000-4-2 (1995), 4 kV CD, 8 kV AD
IEC/EN 61000-4-3 (1995), 3 V/m
IEC/EN 61000-4-4 (1995): 1 kV-(power line)
0.5 kV-(signal line)
IEC/EN 61000-4-5 (1995), 1kV/2kV AC, 1kV signal, 0.5kV DC
IEC/EN 61000-4-6 (1996), 3V
IEC/EN 61000-4-8, 1A/m, 50 or 60Hz
IEC/EN 61000-4-11 (1994), >95% reduction, 0.5 period,
30% reduction, 25periods
GB9254(1998)

Supplementary Information:

The product herewith complies with the requirements of the Low Voltage Directive 73/23/EEC and the EMC Directive 89/336/EEC and carries the CE marking accordingly.

Tested with Hewlett-Packard Co. products only.

Roseville, August 7, 2000

Mike Avery,
Regulatory Engineering Manager

European Contact: Your local Hewlett-Packard Sales and Service Office or Hewlett-Packard GmbH, Department TRE, Herrenberger Strasse 130, D-71034 Böblingen (FAX:+49-7031-14-3143).

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